TEXTILE READER'S GUIDE

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Abstracts

[627]

FIBERS A

Natural fibers A 1

Character of wool-like fabrics

Jack J. Press. *Rayon & Syn. Tex. 32,* 42-45 (Oct. 1951)

The effect of blending wool with viscose, cotton, nylon and acetate, and of variations in weave and fabric weight on the comfort and appearance characteristics of Navy melton uniform fabric is studied using a series of simple coordinated tests. The properties covered include weight, still-air warmth, wind chill, moisture absorption, drape and flex stiffness, wrinkle recovery, crease acceptance, and crease retention. The results are discussed in terms of controlling factors. Possible improvements are reviewed.

Fiber tests held unable to handle cavitomic cotton

Buck Gunter. *Daily News Record,* 47 (Sept. 25, 1951).

See front section.

Recrystallization of relaxed animal fibers

L. G. Jagger & J. B. Speakman. *J. Tex. Inst. 42,* P771-P782 (Aug. 1951).

Data is presented regarding extension of animal fibers in water at ordinary temperatures. Tries to show that weakening of these fibers as a result of extension and retraction is due to molecular disarrangement and disulfide bond breakdown. Shows that molecular rearrangement is promoted by heat-treatment.

What makes neps?

Anon. *Am. Wool Cotton Reptr. 65,* 17-18, 55 (Aug. 9, 1951).

An analysis of the upper half mean length, grade, fiber strength, fiber fineness, percentage of mature fibers, and length uniformity ratio of cotton fibers by the Cotton Branch of the U. S. Dept. of Agriculture showed that these 6 factors were not consistently or significantly uniform in their effect and nep count. The average variance between predicted and actual nep count, explained by the 6 factors, was found to be only 29% of the total difference. Some effects on nep count by

these 6 factors include: more neps will be made from upper half mean length as the fibers increase in length, from fibers having high tensile strength, and from a high percentage of immature fibers. Fewer neps will be made from cleaner, coarser fibers which are more uniform in individual fiber lengths. (See September TTD, page 9.)

Modification of wool

H. Walter Jones & Harold P. Lundgren. *Tex. Res. J. 21,* 620-29 (Sept. 1951).

See front section.

Artificial fibers A 2

Development of synthetic fibers

F. Loasby. *J. Tex. Inst. 42,* P411-P441 (Aug. 1951).

Traces first the historical development of equipment. Discusses a number of the synthetics such as the polyamides, Perlon L, Orlon, Vinyon and Vinyon N, vinylidene chloride, glass, polyvinyl chloride and others. Presents next some synthetic fiber production statistics. Finally, touches on possible future developments.

First year success for dynel

Carl A. Setterstrom. *Am. Wool Cotton Reptr. 65,* 11-12, 54 (Aug. 9, 1951).

Dynel, a copolymer of vinyl chloride and acrylonitrile, has a unique combination of properties and is adaptable to all spinning systems. Due to its versatility of performance, uses have been found in apparel, domestics, industrial and military fabrics. Dynel is also beginning to appear in blends with other fibers. A review is given of the properties and actual and potential uses of dynel fibers.

High speed pot spinning

Courtaulds Ltd. Brit. P. 650,366. *Brit. Rayon & Silk J. 27,* 78 (May 1951).

In viscose pot spinning the building of a cake is controlled by a cam that reciprocates the spinning funnel. The cam has the shape of a cardiac curve combined with its mirror image in which the root and tip are rounded. For high speed spinning excessive vibration can be avoided by rounding off both the root and tip over an angle of 22½° to 30°. A spinning funnel with an undulating or indented lower edge is used.

Historical development of and the outlook for viscose fibers

H. J. Hegan. *J. Tex. Inst. 42,* P395-P410 (Aug. 1951).

Traces the development of viscose fibers starting with the year 1898 to the present. Cites the research carried out to improve such yarn properties as tensile strength, dyeing evenness and freedom from broken filaments. Outlines briefly the outlook for rayon and emphasizes that as long as the cost remains low rayon will always have a promising future.

Long staple synthetics can be processed successfully

Anon. *Am. Wool Cotton Reptr. 65,* 9-10, 57-9 Sept. 20, 1951).

With the greater availability of synthetic fibers, the development of tow to top staple cutting processes, the greater demand for inexpensive light-weight outer wear fabrics, and the indefinite supply and fluctuating price of wool, great progress has been made in developing processes to take full advantage of synthetic fibers. Suitable equipment for processing long staple synthetics have been developed with some methods completely new in design and others that are conversions of older systems. A review of the equipment developed for handling synthetics is presented.

Manufacture of spinning jets

Brit. Celanese Ltd. Brit. P. 648,693. *Brit. Rayon & Silk J. 27,* 76 (May 1951).

Rayon spinning jets with diameters of less than 0.04 mm. can be produced by depositing an electrolyte of metal, such as gold, silver, copper, nickel, palladium, etc., evenly on the walls of larger more easily obtainable holes. A smooth inner surface is formed by the metal which is gradually built up to reduce the diameter to that required. The jet to be plated may be of stainless steel, nickel, platinum, gold-platinum, etc.

Rayon manufacturing begins its fifth decade in the United States

Anon. *Textile Bull. 77,* 135-8 (Mar. 1951).

A history of the American Viscose Corp. and its development of rayon from the crude fiber of 40 years ago to one of the major textile fibers today is reviewed.

Synthetics' biggest chance lies ahead

F. M. Johnson. *Am. Wool Cotton Reptr. 65,* 11-12 (Sept. 20, 1951).

In this report on a talk on synthetics presented at the meeting of the Piedmont Division of the Southern Textile Association, fiber length, denier, fiber and fabric finish and crimp are discussed.

Also reported is the discussion on synthetics which followed the talk.

The Virginia-Carolina Chemical Corp. — Fiber division

Anon. *Textile Age 15*, 16-21 (Sept. 1951).

Vicara, a synthetic textile fiber produced from zein, one of the proteins of corn, is produced by the Virginia-Carolina Chemical Corp.—Fiber division and is now being widely used chiefly in blends with other fibers. In the manufacture of Vicara, the protein raw materials are first blended and then by chemical and physical means converted into a thick, heavy, viscous spin solution which is forced through spinnerettes into a precipitating bath to form filaments. Stretching and curing complete the steps in which the original long and globular protein molecules, uncoiled in the preparation of the spin solution, are tied tightly together and bound permanently into the final fiber. Variations in these operations determine the different specifications and characteristics of the fibers for various uses; and after-treatments tailor the fiber, regulating its strength, making it water-absorbent or water-repellent, soft or harsh, etc. Vicara is being spun on all conventional systems and is processed and handled on regular textile carding, spinning and weaving equipment. Properties of Vicara are reviewed, and facts on the various methods of processing the fiber are given.

Waste cutter for nylon filaments

Anon. *Am. Wool Cotton Reptr. 65*, 49 (Oct. 4, 1951).

A revolving knife cylinder type waste cutter for nylon filaments is reported to reduce downtime and improve the quality of the finished product. The feed apron is raised so that the force of gravity helps guide the fibers between the feed rolls and knives. Baffles are put at the sides of the feed box, the feed roll is lengthened with its ends entirely outside the guide box, and the ends of the feed roll are shaped as to urge the fibers toward the center line of the cutting elements. Knife cylinder speed is adjusted to prevent fanning of the filaments. Mfr.: Taylor-Stiles & Co.

YARN PRODUCTION B

Fiber preparation B 1

Drop in mill efficiency traced to opening room

Anon. *Am. Wool Cotton Reptr. 65*, 9-10, 42-3 (Aug. 16, 1951).

Actual mill experiences in which dirty yarn, low breaking strength, etc., were traced directly back to the opening room are described. In the first case, excessive ends down in the spinning room were traced back through the mill and found to be caused by the type of cotton used. Inadequate blending and inaccurate cotton classing in the opening room had resulted in the purchase and use of brittle cotton.

In another case, excessively dirty yarns were found to have resulted from a partial vacuum in the opening room. Improper placement of the air recirculating filters for the opening line in a new central air conditioning system had caused this vacuum.

In the third experience cited, the conversion of opening lines for mechanically picked cotton created a problem of trash removal. Additional equipment to intensify cleaning without fiber damage or the loss of good stock was found to be necessary, and an additional horizontal opener with several new air condensers aided in restoring to standard the yarn strength and cleanliness of this cotton

Flexibility big factor in modern garnetting plant

H. B. Riehl. *Am. Wool Cotton Reptr. 65*, 14-15 (Aug. 30, 1951).

A brief history of the modern garnet machine is presented. Today the modern garnetting plant aims at the recovery of the maximum fiber length free of threads at the lowest cost per pound, consistent with quality and maintaining the integrity of the original blend. To do this there must be flexibility in the picking and shredding units so as to give each type of rag or thread the most suitable treatment. Garnetts must be built so as to get the proper balance between fiber opening and the reduction of threads at maximum capacity.

Lint cotton cleaner

V. L. Stedronsky & C. S. Shaw (to the free use of the People in the Territory of the United States of America), USP 2,569,501, Oct. 2, 1951.

In a cotton-processing system wherein lint is conveyed through an air duct by air current, a lint cotton cleaner comprising a casing having an inlet port, a rotatable cleaning cylinder housed therein and provided with radially extending saw-tooth-shaped cleaning cylinder teeth, a concave housed in the casing and formed from spaced bars located adjacent the cleaning cylinder teeth, the lint being carried by the teeth into the concave, and means for receiving lint and air

from the air duct, separating a portion of the air therefrom, and feeding the lint and remaining air through the inlet port directly into the cleaning cylinder teeth, an aspirator port being provided in the casing on the side of the inlet port remote from the region of entry of the lint into the concave, and a damper being provided for regulating the exit of air from the aspirator port thus to assist in directing the lint into the cleaning cylinder teeth.

More discussion on figuring blows per inch on pickers

Staff. *Textile Industries 115,* 189, 1951 (Sept. 1951).

Observations made by a contributor on picking are given. Cleaning may be accomplished best on a thin sheet of stock since there is more chance for the air currents to shake the trash from the stock, the mass of stock is broken up sufficiently to allow the trash and motes to drop between the grid bars, etc.

For cleaner grades of cotton 30 to 35 blows per inch are satisfactory to make a yarn with the highest breaking strength and to give a clean lap. On Middling or better cotton 35 blows per inch should be optimum, but on grades below Middling, blows may have to be increased about 20% to get satisfactory cleaning. Important to remember is that the condition of the beaters and grid bars must be good to get satisfactory cleaning regardless of blows per inch.

Fan speeds also are important in trash removal, and speeds of approximately 1000 rpm on back and middle beaters with fan speeds of approximately 1250 to 1300 on the front beater are recommended. Here also perfect condition of fans is necessary.

Reader places emphasis on picker lap tolerances

Staff. *Textile Industries 115,* 191, 193 (Sept. 1951).

In compressing picker laps and producing a lap of greater length with a diameter no greater than that of a conventional lap, the question is raised as to how much the tolerance should be altered upon changing from the conventional lap. This contributor states that he uses a tolerance of plus or minus ¾ of one pound, or a total tolerance of 1½ pounds for a lap with an original standard length of 44 yards, weighing 16 ounces per yard. Calculation of the tolerance is described.

Tips on garnetting

Jas. H. Hunter. *Textile Age 15,* 34-41 (Sept. 1951).

Remarks made before a recent course in Reprocessed and Reused Fibers at the Lowell Textile Institute are presented. Among the subjects discussed are: the functions of the rolls throughout the Garnett, their speeds and gauging; selection and application of the proper stock lubricant or batching oil in garnetting; speeds and gauging with different types of stock; the variable speed doffer; driving a Garnett; use of the 4-cylinder machine; maintenance and cleaning of the Garnett; how to buy Garnett equipment, etc.

Waste removal at the picker

Anon. *Am. Wool Cotton Reptr. 65,* 9-11 (Aug. 30, 1951).

The pneumatic rack control, fringe roll and Universal grid bars are 3 Saco-Lowell units for pickers which are said to have made it possible to obtain more even lap, less loss of good fiber, greater removal of trash, and reduced lap rejects. Through use of the pneumatic rack control lap rejects are reduced, lap evenness is improved, and the building of a larger lap without significant increase in lap diameter is possible. The fringe roll distributes the beater blows over the mass of fibers in a more uniform manner and aids in fiber separation without fiber damage. More efficient waste control is possible through use of the Universal grid bars due to more accurate settings, flexibility in adjusting the bars, the greater control of air currents around the beater. The advantages obtained from use of the 3 units and a comparison of droppings from old and new grid bars are discussed.

Carding and combing B 2

Control of flat strips in carding

R. Cheng & W. E. Morton. *J. Tex. Inst. 42,* P442-P456 (Aug. 1951).

Discusses certain experiments and observations aimed at finding out what happens in that part of a card at and immediately above the front or stripping plate.

Improvised roving bobbin stripper

Staff. *Textile Industries 115,* 193 (Sept. 1951).

Roving bobbins that have been sent back in the card room by the spinning room because of bad work from fly frames, caused by clearer waste, lumps, and hard ends, usually have to be

stripped by hand. A description is given with a diagrammatic sketch of a stripper made in the mill that is said to clean up the bobbins in about one-tenth of the time it takes to clean them by hand. In addition this roving, when run through a waste machine, can't be detected in the pickers at all.

Relation of mote knives to neps and trash in card web

Anon. *Textile Industries 115,* 195, 197 (Sept. 1951).

In one mill the optimum distance between the upper mote knife and licker-in on a card was found to be 0.017″, and between the bottom knife and the licker-in 00.12″, when 2 mote knives are in operation They also found that the best setting between the upper knife and feed plate is 1¼″. Tests made to determine the influence of one or no mote knives on the amount and quality of licker-in waste and the amount of neps and impurities in the card web showed that apparently there is no difference in operation of a card equipped with two, one, or no mote knives. However, further tests are felt necessary since the test was based on only about 150 hours running time.

Drafting and roving B 3

The pin drafter

Staff. *Textile Industries 115,* 123-6 (Sept. 1951).

The pin drafter, when used in the American system, show itself to best advantages in both increased production and improved quality. In principle, the pin drafter is very similar to drawing with intersecting gill boxes as used in the French system but is faster and less expensive.

Operation and maintenance data on the pin drafter, in operation for approximately 3 years are reported by 3 different mills spinning yarn on the American system, is given. Fibers run in these mills include wool, rayon, nylon and their blends with one mill also running Orlon and Fiber V. Data includes sliver variations, production and efficiency figures, draft, cleaning and maintenance, lubrication, and special features. From the data reported it can be seen that the pin drafter not only speeds production, but also produces an even sliver efficiently.

Presser foot

W. G. Reynolds, USP 2,570,007, Oct. 2, 1951.

A presser foot for fly frames is described

which has a pair of parallel paddles, each paddle having a hole through which the roving is passed, each of the holes being provided with a threading slot extending to an edge of its paddle for placing the roving into the holes, the threading slots for the two holes having their outer open ends facing in an opposite direction to each other.

Profits from effective textile machinery lubrication. Article 3. Combing and drawing

F. S. Jones. *Textile Industries 115,* 177, 179, 181 (Sept. 1951).

Lubrication practices in the combing and drawing processes that promote general efficiency by reducing staining, increasing uniformity, and increasing profitable production of processed sliver are discussed. Subjects included are: bearings, plain bearings, anti-friction bearings, and gears and gear trains.

Chromium-plated slubbers

Staff. *Textile Industries 115,* 123 (Nov. 1951).

See front section.

Spinning B 4

Automatic doffer for ring spinning

J. J. Haythornthwaite (to T. M. M. Research) Limited), USP 2,570,057, Oct. 2, 1951.

A device for doffing spinning packages comprises a casing having a forward wall enclosing the lower part of the front of the machine below and alongside the spindle rail, a traveling conveyor band extending within the lower part of the casing throughout a portion, at least, of the length of the machine, the front of the casing consisting of door-like members, means supporting the members for outward tilting movement to positions in which they slope rearward toward and near to the forward edge of the conveyor and in which they are disposed to intercept yarn packages doffed from the machine and guide them onto the conveyor, mechanism connected with the members for moving the same outward to such package guiding positions, and means for operating the conveyor.

A comparison of the 1911 cotton yarn mill with that of today

R. Z. Walker. *Textile Bull. 77,* 150, 152, 154, 156, 158, 160 (Mar. 1951).

The progress made in yarn manufacturing methods during the past 40 years is reviewed by comparing the mill of 1911 and the mill of 1951.

Opening, picking, carding, drawing, roving, and spinning equipment and methods are discussed as well as the changes that have been made in mill construction, atmospheric conditions, etc.

New high draft device

Anon. *Am. Wool Cotton Reptr. 65,* 13-14 (Sept. 6, 1051).

Two new devices announced by the Stellite American Corp. include a new patented spring weighting device for high draft on the ring spinning frame for worsted, blended and synthetic yarns and a new rectilinear comb for long staple synthetics. The spring weighting device allows the application of adjustable pressure on the feed cylinders and draft cylinders in processing twisted or untwisted slivers from any drawing system such as the French, American, Anglo-Continental or Bradford. Advantages claimed include better fiber control during the draft operations, work of the operators facilitated, reduced maintenance costs, etc.

The new comb is equipped with a new modified sword to obtain a well-condensed regular web and a new adjustable false twist device to produce a firm sliver. It is suitable for processing short and long fibers from ¾ inch to 8 inches and longer and is capable of handling wools, linen, silk, and all kinds of synthetic fibers.

Review of the development of cotton spinning machinery

G. Dakin. *J. Tex. Inst. 42,* P457-P478 (Aug. 1951).

Traces the development of cotton spinning equipment from approximately 1750 to the present and considers briefly the lines along which future developments may take place. The aspects covered in this review include: drafting and drafting systems, twisting and winding-on systems, and other machine features such as the ring and mule frames. As regards the future, the author stresses the importance of continued fundamental research.

Saco-Lowell worsted system

Gilbert D. Harrison, Jr. *Am. Wool Cotton Reptr. 65,* 11-12 (Oct. 11, 1951).

Results obtained with the Saco-Lowell worsted system have not as yet been fully realized since the first commercial installation was only made in 1950 and because of the relatively small size of installation. However, from tests made by Saco-Lowell the yarn is reported to compare very favorably with that produced on the French

or Bradford system in evenness and appearance. The versatility of the system has also been demonstrated with economies resulting from the spinning of finer counts on long drafts.

The system starts with top from the gill box or pin drafter which passes through the DSI drawing frame, a 2-Zone system consisting of 4 lines of bottom steel rolls and 3 lines of top rolls. The roving and spinning drafting unit is referred to as the "type 4" drafting unit, the roving frame itself known as the FS4 and the spinning frame as SS4. The "type 4" units vary chiefly from that of the drawing frame in that there is a single rather than a double drafting zone, and fiber control is affected by use of a roll and apron rather than rolls alone. The roving control unit consists of a smooth metallic shell roll cooperating with an apron which passes over and is driven by the middle bottom roll which is of smaller diameter under the center portion of the apron than under the edges. On the spinning control unit there is an additional small diameter self-weighted control roll located well forward on the apron and as close as practical to the nip of the front roll. The apron driving roll on both the roving and spinning units employ the gap principle. Details of the operation of the system are described.

Some aspects of the early history of spinning, with special reference to wool

H. Lemon. *J. Tex. Inst. 42,* P479-P501 (Aug. 1951).

Traces the development of spinning from its earliest inception (the Miocene period is mentioned as the time when spinning started) to the present. Rather detailed descriptions of early spinning devices (spindle and distaff and spinning wheel) are presented.

Spinning costs are too high

P. M. Thomas. *Textile World 101,* 4 (Oct. 1951).

See front section.

Spinning cot

R. C. Treue (to The Dayton Rubber Co.), USP 2,569,546, Oct. 2, 1951.

A spinning cot for the processing of textile fibers which is relatively free from eyebrowing and lapping up during operation in both dry and humid atmospheres which comprises a body of rubber composition having glass fibers uniformly dispersed therein, the fibers being substantially parallely arranged with respect to each other comprising longitudinally elongated cavities pro-

duced by the removal of fibers from the surface and the axis of the cot, and extending longitudinally of the axis, the surface of the cot.

The spinning traveler

Jas. Osborne. *Textile Age 15,* 8-14 (Sept. 1951).

The development of the traveler not only increased the production per spindle, but also reduced the cost of cotton yarn. Today more than any article in the mill supply room the traveler delivers more accuracy, more poundage per unit dollar, and a higher efficiency. The manufacture of travelers; the function and importance of the traveler cleaner; variables which affect traveler operation: spindle speed, ring condition, roving condition, traverse of the frame, package density; and selection of travelers are discussed.

Thread feeler for spinning and twisting

B. Melin & H. Jeppson (to Instrumentfirman Inor, Alfred Brakl), USP 2,569,728, Oct. 2, 1951.

The thread feeler signals broken ends, and contains an electric power source, conductor means extending an electric circuit from power source to contacts and to the metal frame of the machine, and electric indicator connected to conductor to indicate when one of contact arms engages a metal part on breakage of the yarn.

Winding and spooling B 5

Improvements to the Giromat

Anon. *Skinner's Silk & Rayon Rec. 25,* 846 (June 1951).

Improvements to the "Giromat," fully automatic pirn winder made by Brugger & Co. Ltd., include: a revised method of tensioning yarn by setting a pointer against a graduated scale on the tension; modification in the construction of the spindle unit to take pirns up to 10 inches in length; simplification of adjustment for pirn diameter; redesign of traverse gearing to give a wider range of winds; a new tension compensator device to keep yarn tension constant; etc.

The mill of today. 24 — The modern winder

Robert Z. Walker. *Textile Bull. 77,* 73-4, 76 (Apr. 1951).

The lap winder, developed from the old derby doubler and the ribbon lapper, is used to make a lap of slivers to be creeled into either the back of a lap-back drawing frame or into the comber. Although the lap winder is of rugged construction,

it still must be periodically checked to keep quality and production up to standard. Points that should be checked both in operation and maintenance are discussed.

Plastic yarn carrier for B-C spoolers

Staff. *Textile Industries 115,* 115 (Sept. 1951).

A new yarn-carrying sleeve for Barber-Colman spoolers is made of Uscolite, a thermoplastic blend of rubber and plastic, and is said to have more than 5 times the impact strength of phenolic varieties now used. It will not shatter, chip, warp, nor nick around the edges and is expected to greatly reduce maintenance costs. Yarn is carried more securely due to a waffle design on the surface of the sleeve. The carrier can be used with cotton, rayon, and the newer synthetic fibers spun on the cotton system. Mfr.: United States Rubber Co.

Unique roving twisters

Staff. *Textile Industries 115,* 136-8 (Sept. 1951).

Roving twisters (8x4), designed by Saco-Lowell for Mallison Braided Cord Co., make hard twist single yarn and put it directly onto the braider bobbins, eliminating the backwinding operation from roving bobbins to braider bobbins. The frames are like a conventional fly frame with the following exceptions: short bolsters and small diameter spindles are used because of the small bore of the braider bobbins; bronze bushings fixed in a hold down plate serve as bearings for the spindle tops; no builder motion is required since the frames make the same length traverse each time with no taper at the flat ends of the braider bobbins; and the flyers do not have hollow legs but have yarn wrapped around the outside and through a pigtail at the end. In operation since February 1950, savings have been effected on labor, waste, bobbins, power, floor space, and boxes.

Winder

J. G. Kershaw (to Drummondville Cotton Co., Ltd.), USP 2,568,960, Sept. 25, 1951.

A winding frame, comprising a frame, a winding spindle having a fixed axis mounted on the frame, means for rotating the spindle to wind yarn thereon to form a package, a traversing mechanism including a guide eye for guiding yarn on to the spindle, speed varying means connected to the spindle rotating means, the traversing mechanism being pivotally mounted for movement away from the spindle as the package grows, a

notched plate pivotally attached to the traversing mechanism and slidably mounted on the winder frame, a gear rotatably mounted on the frame, a toothed rack engaged with the gear, the toothed rack being adapted to engage in the notches in the notched plate, means for urging the toothed rack into engagement with the plate, a sprocket gear in direct connection with the first named gear, a chain in meshed engagement with the sprocket gear, the chain being workably connected to the speed varying means, whereby as the package increases in diameter the traversing mechanism in moving away from the package spindle moves the notched plate allowing the toothed rack to shift to subsequent notches thereby varying the speed of the fixed axis spindle in direct relationship to the diameter of the package.

Yarn testing and numbering B 10

Predicting cotton yarn strength

John Duerst. *Textile Industries 115*, 161, 163 (Sept. 1951).

A yarn strength formula, which is the result of an analysis of some quarter million individual tests of yarns from 10s to 11s, made of 7/8" to 17/16" American and Egyptian cottons, is presented. The amount of twist, cross section of fiber-bulk, coefficient of fiber friction, and length of fibers are factors of equal importance in the development of the formula. Principles involved in its development are based mainly on Duerst's Hexagonal Fiber Pattern theory involving numbers of fibers per cross section as expressed in terms of yarn counts.

Testing and specification of yarn — with particular reference to continuous filament nylon yarn

F. J. Alexander & A. R. Munden. *J. Tex. Inst. 42*, P717-P753 (Aug. 1951).

This paper deals with testing against a specification. Considers the origin of a specification, the requirements of a specification test and the sampling problems that arise in specification testing.

FABRIC PRODUCTION C

Yarn preparation C 1

Cotton yarn sizing materials, preparation and and practices. Part 3

W. E. Shinn, C. Boyce Sink & Mary E. Parker. *Textile Bull. 77*, 85-6, 90-1 (Apr. 1951).

In this third part of a survey on cotton yarn

sizing materials, preparation, and practice, sizing practices are dealt with. Extracts from the literature, taken mostly from magazine articles, are reprinted on size concentration, effect of stretch, temperature, penetration, moisture content, and squeeze rolls.

Electronic textile control device

W. C. Anderson (to Deering Milliken Research Trust), USP 2,569,442, Oct. 2, 1951.

In a textile machine, the combination comprising means for advancing a plurality of threads under tension, guide means for each thread movable in response to reduction in tension of its associated thread, a pair of electrical contacts associated with each guide means and adapted to be closed upon movement of the associated guide means, a source of electrical energy, a plurality of circuits, each including an electronic tube and a relay connected in series across the source, a control circuit for each tube, each control circuit including a plurality of the pairs of electrical contacts and operating upon closure of any pair of contacts therein to deenergize the tube controlled thereby, means responsive to release of a relay consequent to deenergization of the tube in series therewith for stopping the first mentioned means and interlocking means preventing successive release of said relays.

New homogenizer helps Jefferson Mills

S. F. Bryan. *Textile World 101*, 123, 250, 254 (Oct. 1951).

See front section.

Past and present trends in textile drying

F. W. Thomas. *J. Textile Inst. 42*, P703-P716 (Aug. 1951).

Traces the early history of drying. Describes and discusses various types of drying machinery such as cylinder, stenter, tensionless and roller dryers. Also discusses the warp, hank and package drying of yarns.

Rayon warp sizing, old and new

J. H. MacGregor. *J. Tex. Inst. 42*, P521-P537 (Aug. 1951).

Gives a description of the historical development of the sizing of rayon warps, the sizes used and their application and removal.

Single-end nylon sizing

Imperial Chemical Industries Ltd. Brit. P. 650,974. *Brit. Rayon & Silk J.* 27, 78 (May 1951).

Yarn is drawn vertically overend from the supply package, through tension guides, and then

glances across the surface of a smooth roller rotating in the size. The yarn then passes upward vertically past the traversing device and is wound on to a horizontally rotating flangeless tube. A smooth rod or finger, that can swing across the face of the bobbin pushing the yarn before it, causes the yarn to traverse and build up a bobbin with tapered ends. The size is dried on the bobbin by enclosing half the circumference in a metal shield containing an electric or an infra red heater. A winding tube of very wide diameter is preferred with only a thin layer of yarn built up on it.

Things to come in warp sizing

J. F. Fitzgerald. *Textile Age 15*, 21 (Oct. 1951).

See front section.

Tips from the size box

J. F. Fitzgerald. *Textile Age 15*, 21-31 (Oct. 1951).

A review of some of the most common yarns shows the types of sizes applied at the slasher. Combed cotton, carded cotton, woolen, single worsted, viscose, filament, nylon, and vinyon yarns are described, along with the sizes commonly applied. Kettle mixes, newer types of slashing equipment, gums, casein, tallows, enzymes, defoamers, chlorinated sago, and other technical details are discussed.

Weaving C 2

Design in silk

A. B. Hunter. *J. Tex. Inst. 42*, P590-P604 (Aug. 1951).

Traces the art of silk weaving in China, Rome, Persia, Italy, France and England. The paper is entirely historical in its concept.

Draper looms of 1911 and how they grew

Frank D. Herring. *Textile Bull. 77*, 163-4, 166, 170-2 Mar. 1951).

Highlights in the mechanical improvements and advanced methods that have been adopted on the Draper-Northrop loom to improve the running of the loom and the quality of the woven fabric over the past 40 years are reviewed. The developments of the filling-changing battery, the warp stop motion, the filling feeler, and thread cutting devices are considered to be the four main features in making the Draper loom completely automatic.

Future for loom designers

E. Cotterill. *J. Tex. Inst. 42*, P605-P614 (Aug. 1951).

The present paper is divided into five sections. In part one, the characteristics of the present loom are described. Part two poses a number of questions in respect to increasing speed, decreasing wear and tear on the loom and simplifying the work of the weaver. Parts three, four and five deal with the looms of the future in which methods for decreasing the price of construction as well as increasing weaving efficiency, decreasing operational costs and providing quality fabrics are discussed.

An introduction to weaving and kindred processes — 3

A. T. C. Robinson. *Skinner's Silk & Rayon Rec. 25*, 818, 820, 822 (June 1951).

The invention of the fly shuttle and its application to hand weaving by John Kay are reviewed so as to introduce the more important basic ideas and technical terms of weaving. A modern counterpart of Kay's fly shuttle loom, the modern plain cotton loom, is then described with its various mechanisms discussed.

Lease comb

R. H. Baines, T. Eccles & S. M. Fulton (to Celanese Corp. of America), USP 2,569,649, Oct. 2, 1951.

A leasing comb comprising a bottom frame member, a series of long and short dents secured to the bottom frame member and alternating along the length thereof, the spaces for the accommodation of warp threads between each short dent and the two adjacent dents being of different depths, and a top frame member adapted to space and to secure in spaced relationship the tops of the long dents, the top frame member being detachable from the dents so as to leave the spaces between the dents clear for warp threads to be dropped between the dents.

Loom motor power supplies

S. A. Bobe. *Textile Industries 115*, 156-7, 159, 231, 233 (Sept. 1951).

Safety in operation and maintenance, reduction of fire hazards, ease of servicing, and adequacy of equipment to perform required functions are necessary features for power supply layouts in the modern weave room. New equipment and modern practices have made possible safer and better protected installations for weave rooms with the result of more dependable operation. In this treatise on weave room power distribution

systems and electrical equipment installations, the main feeder, branch circuits, group starting, modern starters, mounting switches, and motor leads are discussed.

Looms and warping mills from Germany

Anon. *Skinner's Silk & Rayon Rec. 25,* 824 (June 1951).

Features of the non-automatic dobby loom and the warping machine of Jean Glisken of Dulken, Germany, are briefly described.

A new selvage motion for rayons

Anon. *Skinner's Silk & Rayon Rec. 25,* 822, 824 (June 1951).

A new selvage motion, invented by Sidgwick Silks Ltd. of Holybrook Mills, is described. The motion provides an improved method of weaving selvages on rayon fabrics. Featured in the motion are a rail and bracket which are bolted and can be adjusted vertically and horizontally.

Practical terry weaving and designing. Article 1

T. Hargreaves. *Textile Industries 115,* 130-2 (Sept. 1951).

Terry cloth is a combination of 2 cloths: the bottom warp, or ground, interlaced with the filling to form a firm foundation texture; the top warp, or pile, interlaced with the filling to form the loops. Three essentials necessary for production of terry cloth include: correct interlacing of the threads; use of 2 warps and their correct tensioning; and mechanical movement of the reed position during weaving so that the filling is beat-up to the fell of the cloth only after every 3 picks. Plain terry cloth has the loops evenly and equally distributed over the face and back of the fabric and can be woven on as few as 4 harnesses. Fancy terry cloth requires a more complex loom equipped with a dobby head or a full harness Jacquard head or both.

Diagrams and discussions are given on the following: the ground weave of a regular 3-pick terry; the ground and pile weave combined to give the full 3-pick terry weave; the weave, drawing-in draft, and chain-pegging plan for a plain terry woven on 4 harnesses on a cam loom; the layout of a sample towel using colored loops on face and white loops on back with the border formed by narrow plain tabs and reversed colors; and the drawing-in draft and chain drafts for the 2 cylinders to weave the sample towel.

Progress in C. & K. loom building from 1911 to now

John C. Irvin. *Textile Bull. 77,* 174, 176 (Mar. 1951).

A brief review of the progress that has been made since 1911 in the Crompton and Knowles loom is presented.

Reactions of garment fabrics, accessories, and methods of garment manufacture to dry-cleaning

E. J. Davies. *J. Tex. Inst. 42,* P820-P826 (Aug. 1951).

Presents certain common faults in fabrics, garments and accessories and shows how these faults will be emphasized by dry-cleaning in Stoddard's solvent and trichlorethylene.

So you want good cloth! Part 23 — Care of the shuttle

Frank D. Herring. *Textile Bull. 77,* 91-2, 94, 96, 98 (Apr. 1951).

The shuttle takes severe punishment while the loom is in operation, and bad shuttles or improper care of the shuttles cause a large percentage of loom stops and cloth imperfections. Proper care and attention of shuttles is therefore of great importance and should begin when a new shuttle is installed in the loom. The proper adjustments that should be made when a new shuttle is put in the loom are outlined with the reasons for making the adjustments detailed. Not only will this checking prolong the life of the shuttle, but it will also serve as preventive loom fixing.

Substantial weave room savings attributed to use of thread friction testing device

Anon. *Textile Bull. 77,* 98, 100 (Apr. 1951).

"Tension-Rite," manufactured by Air Engineering Co., is a thread friction testing device for use in laboratories, weave rooms and other departments. Under any constant speed, any type yarns through any type make-up of tensions used may be tested by the device. The "Tension-Rite" is said to aid in prolonging the life of shuttles, reeds, loom leathers, and pickers by the proper cycle of inspection and tension correction. Savings are also reported in winding and battery hand costs and handling.

To weave duck on plain looms

W. C. Westbrook. *Textile World 101,* 117, 284, 286 (Oct. 1951).

See front section.

Knitting C 3

Cleaning full-fashioned knitting machines

Anon. *Textile Age 15,* 64-7 (Sept. 1951).

Recommendations made by Textile Machine Works for cleaning nylon size from the parts of the full-fashioned knitting machine and for pre-

venting the build-up of such accumulation are given. A cleaning solution consisting of 98% soft water, 1¾% sulfonated mineral oil, and ¼% wetting agent is recommended for needles, sinkers, dividers, etc. Notes on when, where, and how much of the solution should be used are given. Also discussed are the cleaning of moistening troughs,, welt bars, and other parts such as sinker-heads, narrowing rods, carriers, etc.

Development of fine gauge knitting machines

W. A. Dutton. *J. Tex. Inst. 42*, P615-P632 (Aug. 1951).

Deals chiefly with progress made in the development of knitting machines since the middle of the nineteenth century. Cites that progress has resulted primarily because of the following:

(1) mechanization of knitting machines;
(2) increasing speed of knitting;
(3) change from coarse to fine gauge frames.

Discusses and develops the three reasons for improvement.

Fabric take-up mechanism for textile machines

E. M. Zesch (to Karl Lieberknecht), USP 2,569,394, Sept. 25, 1951.

In fabric take-up mechanism for textile machines, a fabric draw-off reel and racking means for turning it; means to prevent reverse rotation of the reel; a floatingly-supported horizontal lever with a weight thereon operative, through the racking means, to normally torsion the reel for maintenance of the fabric under tension; means for periodically actuating the lever for communication, through the racking means, of incremental rotary shifts to the reel to take up the fabric; and means for shifting the weight along the lever to vary the tension on the fabric during its formation.

French circular sinker wheel weft knitting machines. Part 2. Setting for plain knitting machines

A. T. Cole. *British Rayon & Silk J. 27*, 55-7 (May 1951).

The French circular sinker wheel weft knitting machine consists basically of a circle of needles which revolve clockwise with 4 or 5 sets of wheels or "feeders" arranged around the cylinder of the machine. In plain knitting, each of these feeders knit into the fabric, needle by needle, in an anti-clockwise direction around the needle circle one "weftwise" row of loops in a continuous spiral form at the rate of about 33,000 loops per minute at each feeder. An explanation of the knitting action of this machine for plain knitting

is given and includes the following subjects: pushing back, yarn feeding, loop forming, pressing and landing, knocking-over and clearing, the fabric draw-off mechanism, and mending of damages which occur during the knitting process by the operator.

Knitting machine

G. E. Henning (to Western Electric Co., Inc.), USP 2,568,806, Sept. 25, 1951.

In a machine for knitting strand material about a core, a rotatable needle guide cylinder having non-radial guideways formed therein, reciprocable knitting needles positioned in the guideways with the hooks of the needles directed non-radially with respect to the guide cylinder, and means for feeding the strand of material to the hook of the needle, each of the hooks being positioned to face somewhat in the direction of rotation of the cylinder and adapted to engage the strand out of contact with the guide cylinder when the needles are reciprocated in knitting the strand material into a fabric about a core.

Knitting machine

P. W. Bristow (to Scott & Williams, Inc.), USP 2,569,706, Oct. 2, 1951.

A knitting machine comprising a needle cylinder, needles carried by the cylinder, means carrying a wrap yarn for presentation to needles, a wrap horn about which the wrap yarn is drawn during a wrapping operation, and means mounting the wrap horn for universal adjustment.

Knitting machine

P. J. Schoenster & M. E. Ebert (to Alfred Hofmann & Co.), USP 2,569,582, Oct. 2, 1951.

In a straight knitting machine, a fixedly supported sinker head with a forward projection providing a press edge; a bar with spring beard needles adapted to be moved toward and away from the press edge during stitch formation; vertically-arranged auxiliary beard presser elements adapted to coact with individual needles and disposed beneath the forward projection of the sinker head, each such element having a longitudinal slot medially of its height; a fixedly supported holder in which the presser elements are maintained in definite separation with capacity for independent up and down and pivotal movement; a horizontal pivot rod within the holder passing through the slots of the several auxiliary presser elements; means operative during the knitting to select varying numbers of the presser elements; and actuating means for lifting and at the same time moving the selected elements about the pivot

rod so that their upper ends are positioned to the front of the presser edge.

Photoelectric warp stop motion

Brit. Celanese Ltd. Brit. P. 650,210. *Brit. Rayon & Silk J. 27,* 76, 78 (May 1951).

A warp stop motion for warp knitting machines comprises two light sources, fixed at one side of the machine, one below each sheet of warp threads. Narrow collimated beams of light are projected by these sources on to corresponding photocells fixed at the opposite side of the machine. As a thread breaks and falls down, it momentarily causes a change in the intensity of light received by the cell. A special electrical circuit is provided whereby the short pulse in electronic emission from the photocell can be amplified and extended so as to cause positive cutting-out of the driving motor.

Tips for full-fashioned mills from the editors' notebook

Staff. *Textile Industries 115,* 127 (Sept. 1951).

Suggestions made for full-fashioned hosiery mills include the use of a sand-blasted chrome-plated carrier for reducing static on knitting machines; use of black gloves for hosiery examiners when handling grey goods to provide better contrast; and the use of hot water circulating pipes embedded in concrete in the floors to assure even radiation of heat around components of machine. A tip for testing knitting yarn lubricants consists of preparing standard emulsion sample from concentrate, letting solution stand for several weeks in gallon glass jags, and rejecting the fluid if the emulsion separates.

Warp knitting technology. 2nd series. 1

D. F. Paling. *Brit. Rayon & Silk J. 27,* 60-1 (May 1951).

The F. N. F. machine is capable of continued operation at a speed of 1,000 courses per minute, and its patterning scope is identical with that of a similar two-bar bearded needle warp loom. The needle used in the F. N. F. machine combines many of the advantages of both the latch needle and the bearded needle so that it is a suitable element for use at the high rate of speed of the machine. A description is given of the F. N. F. needle, and details of the knitting cycle are described.

Special fabrics C 4

Bonded fiber fabrics

G. H. Elliott. *J. Tex. Inst. 42,* P661-P674

(Aug. 1951).

Discusses several methods of producing bonded fiber fabrics. Such methods include use of heat, (on cellulose acetate or thermoplastic fibers) impregnation with latex, use of adhesive materials (such as polyvinyl acetate) and impregnation with either viscose, cellulose ethers or strong sulfuric acid. Various uses of these types of materials are cited and data are presented to show some of the physical properties.

Fine-yarn sheer crepes

Anon. *Am. Wool Cotton Reptr. 65,* 9-10 (Oct. 11, 1951).

Through the use of a wide range of yarn deniers and turns per inch, a great variety of crepe materials may be produced. A fine yarn sheer crepe is analyzed that does not have a great amount of shrinkage or contracting capacity either in the warp or filling due to its light weight. Viscose yarns of the same fine denier are used in the warp and filling. S and Z twist are used alternately on the warp yarn to produce a flatness in the material, and because of loom conditions, the filling is inserted two picks of S and two picks of Z twist.

Nubby rayon satin

Anon. *Am. Wool Cotton Reptr. 65,* 11-12, 14 (Sept. 6, 1951).

Nubby rayon satin fabrics usually have a rather large number of ends per inch due to the warp being woven with a satin weave with yarns of medium or fine denier. They are likely to be of heavy weight because of the large number of ends in the warp and the heavy filling yarn required. Also, a higher than usual construction, at least in one direction, is necessary to obtain enough friction to prevent slippage. An analysis is given of a nubby satin in which very dull acetate warp yarns are combined with a filling yarn composed of two single yarns of identical denier. The yarn used in the filling is of seed character resulting in a shorter irregularity on the face of the fabric, and a high twist in the filling yarn accounts for small waves throughout the width in the warp direction.

STANDARD FINISHING D

Air motors insure more even pressure for padder

Staff. *Textile Industries 115,* 115 (Sept. 1951).

Features of a new padder, made by Riggs & Lombard, Inc., includes diaphragm type air motors which insure more even pressure from

side to side, a stainless steel jacketed bottom roll and rubber covered top roll, a stainless steel tank with suitable immersion rolls at the entering side under the main rolls, cloth guiders to keep the cloth centered as it enters the tank, an expander roll to insure that the cloth goes into the main rolls open width and wrinkle free, etc.

Benefits of processing cotton with synthetic detergents

O. M. Morgan. *Am. Wool Cotton Reptr. 65,* 59, 61, 65-6 (Sept. 27, 1951).

Synthetic detergents have greatly improved the cleaning and processing of cotton by effecting economies in the amounts of other chemicals used, accelerating existing operations, eliminating or minimizing hard water difficulties, increasing production, etc. The use and advantages of using synthetic detergents in kier boiling, bleaching, desizing, and dyeing of cotton are discussed.

Finishing machinery drives

T. M. Greer. *Am. Wool Cotton Reptr. 65,* 11-12, 53, 55 (Sept. 13, 1951).

Drive requirements for finishing machinery must not only meet all operating requirements but must also provide the necessary control which is all-important. For batch operations, drive requirements are horsepower, speed range and the degree of automatic control desired; while for continuous ranges, tension control and flexibility of operating arrangement are required as well as the 3 factors necessary for bath machines. A number of general types of drives are applicable to batch machines, but the adjustable voltage d-c drive is preferred for continuous ranges. Drive requirements and selection and the different types of drives for finishing machinery are discussed.

Fundamentals of hot air drying. Part 2.

Leo Walter. *Textile Bull. 77,* 103-4, 106-7 (Apr. 1951).

Automatic control of hot air dryers can only be applied when the working conditions of the dryer are good, and the drying efficiency with hand control is satisfactory. Plant characteristics also play a large part in the success of automatic control. Subjects discussed in this article on hot air drying include: the value of recirculation, the advantage of reducing exhaust temperature, humidity control of hot air dryers, basic temperature control problems, combined temperature and humidity control, and zone drying.

Hosiery dryer

Staff. *Textile Industries 115,* 167, 169 (Sept. 1951).

The new Smith-Drum hosiery conveyor drying cabinet, installed at the Universal Dye Works, is a unit designed to cut down many of the handling steps of post boarding. The machine will dry dyed and extracted hosiery in a relaxed state, without forms, and deliver the goods ready for pairing. The machine consists of a feeding end, two drying sections, and a delivery end all bolted together to form the complete cabinet. Hosiery is moved through the cabinet on a Bethanized wire, balanced weave, flexible metal conveyor belt, and hot air directed downward toward the belt secures the hosiery to the belt while in transit. A set of rib-type heating coils which permit circulated air to be heated to the proper temperature is provided on each side of the cabinet, and both ends of the cabinet are provided with controllable fresh air inlets. Controllable hot air outlets are located at the top of the cabinet. A control panel, mounted on the delivery end of the cabinet, regulates drying temperature, belt speeds, air circulation, etc. Rapid production without stops, changes of forms, or excessive handling; reduction in snags; tensionless drying; positive matching; low steam consumption; etc. are advantages of the machine. A description of its operation is given.

Machine continuously sets nylon fabric by radiant heat

Staff. *Textile Industries 115,* 211-2 (Sept. 1950).

A nylon setting machine, designed to be installed on existing tenter frames, permanently sets nylon tricot fabrics at a continuous rate of 16 yards or more per minute. It consists of aluminum reflector units which house "Calrod" tubular heaters, and automatic temperature control is provided by "Reactrol," an electronic unit. Operating costs are reported less than $1.00 with the radiant heat setting requiring only 5 steps and the width of the set fabric being constant. Dyeing can be done either before or after setting. Sufficient temperature range is provided to treat other synthetics such as Dacron and Orlon. Mfr.: McCreary Machine Works.

Modern concept of finishing

P. T. Gale & R. J. Smith. *J. Tex. Inst. 42,* P579-P589 (Aug. 1951).

Provides historical background of finishing and discusses the effect of new fibers, physical requirements of fabrics and the effect of finishing agents on modern finishing methods.

New bleaching range cut costs, raises quality at Dundee

E. Dalton White. *Textile World 101,* 118-19 (Oct. 1951).

Heavy goods are run at 70-80 yards per minute at Lowell Bleachery South, Dundee Mills, Griffin, Ga., while lightweight goods are run at 90-100 yards per minute. The new open-width continuous-bleaching equipment features the elliptical bottom rolls designed and installed by Greenville Steel and Foundry. Complete technical details are given of the new range.

New guanidine derivative textile auxiliaries

Am. Cyanamid Co. Brit. P. 650,820. *Skinner's Silk & Rayon Rec. 25,* 826 (June 1951).

Softening and wetting agents suitable for use as textile auxiliaries are made by combining guanidine with alkyl groups of high molecular weight and with ethylene oxide groups.

New washer shows distinct advantages

Anon. *Am. Wool Cotton Reptr. 65,* 51, 53, 61 (Aug. 23, 1951).

The Flex Reel Washer of the James Hunter Machine Co. has doubled production; reduced the power, soap, water, and steam consumption; reduced the number of seconds; and saved labor at the Arnold Print Works where it is installed. The individual reels in the machine, which are the key to its operation, each consists of two stainless steel flanges, rigidly mounted on a shaft, with 8 flexible rubber slats stretched between the flanges. Only a slight amount of tension in the cloth will deflect these slats, and the reel is thus able to adjust itself to the speed of the cloth approaching it. The cloth passes from a set of metering squeeze rolls, which draw the cloth into the unit at a set rate of speed, over the bottom idle roll, then over the first Flex Reel, etc. The cloth is under just enough tension to pull it through the washing bath, and a dancer roll regulates the squeeze rolls at the leaving end of the machine. This operation compensates for shrink or stretch.

Recent developments in mechanical finishing of textile fabrics. I — Wool Fabrics & II — Cellulosic Fabrics

C. S. Whewell & H. A. Turner. *J. Tex. Inst. 42,* P633-P652 (Aug. 1951).

Illustrates the new approach to mechanical finishing by brief accounts of the modern views on the science and technology of operations such as crabbing, milling, raising and pressing wool fabric, and of mechanical processes used in finishing fabrics made from cellulosic materials.

Some problems relating to sewing

L. H. Scott. *J. Tex. Inst. 42,* P653-P660 (Aug. 1951).

Presents a number of problems in regard to sewing, resulting from the increasing use of synthetic fibers in various types of thread. The problems referred to are broken down into three categories which comprise (a) puckering of seams, (2) fabric scorching or fusing and (c) cutting of yarns.

Stainless steel equipment

Anon. *Am. Wool Cotton Reptr. 65,* 13, 15 (Sept. 20, 1951).

Advantages discussed in the use of stainless steel equipment for finishing processes include: no saddening or dulling effect on colors, washes easily and quickly, gives results comparable to laboratory tests, no deterioration, and less maintenance cost and breakdown time. Of particular importance to the finisher is that stainless steel equipment is free from rust and stains and is corrosion and heat resistant. However, it is necessary to clean stainless steel equipment at regular intervals so as to keep its surface free from marks or scratches which have direct bearing on the corrosion of stainless steel.

Surface active agent

H. C. Borghetty & J. J. Bernard. *Am. Wool Cotton Reptr. 65,* 19, 21, 83, 85, 97 (Aug. 23, 1951).

Triton X-100, a non-ionic water soluble polyoxyethylene agent developed from a completely synthetic base, is compatible with the majority of textile chemicals and is stable to acids, alkalies and salts found in hard water. It is a highly versatile surface active agent and is used as a wetting agent in desizing, kier boiling detergent for cotton yarns and fabrics, bleaching penetrant, boil-off agent for rayon fabrics, raw stock wool scouring detergent, carbonizing assistant, etc. A discussion of its properties and some of its applications is presented.

Tensionless calender for tubular knit goods

Staff. *Textile Industries 115,* 199 (Sept. 1951).

Knitted fabrics can be spread, steam and folded with total elimination of lengthwise dray or tension on the "Tube-Tex" tensionless calender. In addition, uniform widths, wider widths if desired, fleecier brushed fabrics, uniform top and bottom steaming, and greatly improved quality are reported for the machine. An internally driven patented "dual propeller spreader" is in-

corporated in the unit, and steaming and calendering are done while the fabric is in a relaxed, overfed condition. A conveyor then carries the fabric to a patented tension-free flat folding or rolling-up mechanism. Relaxation shrinkage of fabrics finished on this machine is reported reduced by as much as 75%. Mfr.: Tubular Textile Machinery Corp.

Theory of washing

K. Swanston & R. C. Palmer. *J. Tex. Inst. 42*, P675-P690 (Aug. 1951).

Discusses the theoretical aspects of washing with special emphasis on the total amount of soap required to remove a given amount of oil. Describes the nature of various types of dirt and of soap and detergent solutions. Cites the effect of salt in increasing adsorption. The amount of detergent used in washing is discussed and the manner in which detergent is "lost" is described.

Tips on wet processing

Staff. *Textile Industries 115*, 139-55 (Sept. 1951).

Highlights in the history of the AATCC are given together with information on the 30th annual convention of this organization.

Points to be watched in wet processing are surveyed under the following headings: compressive shrinking, printing, warp sizing, hosiery dyeing, resin treating rayon fabrics, continuous bleaching, yarn dyeing, instruments, and mill defects.

Versatility gives stainless steel lead in finishing units

H. F. Creegan. *Am. Wool Cotton Reptr. 65*, 12-13, 43 (Aug. 30, 1951).

Due to its high degree of corrosion resistance, smooth surface, and eye appeal, stainless steel is finding increased use in finishing units for the woolen and worsted, rayon and silk, and synthetic fiber industries. In this discussion of the use of stainless steel, it is noted that washers, dyeing machines, and bleaching units are today practically all made of stainless steel.

Wool processing with synthetic detergents

O. M. Morgan. *Am. Wool Cotton Reptr. 65*, 9-10, 44 (Sept. 6, 1951).

Synthetic detergents are found today in practically every wool wet processing operation. This is due to the fact that the use of synthetic detergents effects savings in the amount of detergent used, reduced water requirements, savings in the fuel to heat water, reduced processing time, greater production rates, etc. A discussion of the use of synthetic detergents in wool processing is given.

DYEING AND PRINTING E

Application of vat dyes to piece goods

Ormond W. Clark. *Calco Technical Bull. 822*, 21 pages (Oct. 1951).

At the time of their introduction to the dyeing industry, vat dyes were applied to textiles from baths containing the vat dye in reduced form as the sodium leuco compound. While this method of application is still used, it has been superseded in importance by methods which first impregnate the fabric with a dispersion of unreduced vat dye and subsequently reduce and fix the dye as nearly "in situ" as possible. Very soon after the introduction of vat dyes a trend away from batch methods towards continuous methods became evident but only light shades could be dyed continuously. In recent years, the dyeing industry has recognized that the tremendous increase in rate of reaction which accompanies increased temperatures is applicable to vat dyeing processes and this fact is the basis of modern continuous dyeing processes which dye a full range of shades. High speed continuous processes for the reduction and fixation of vat dyes that are applied to cloth by pigment padding depend upon elevated temperatures to accelerate reduction. The fastness and the surface appearance of dyeings made from a solution of the sodium leuco compound are improved by subsequently passing the padded cloth through a high temperature reduction process.

Topics covered by the booklet are: jig dyeing, padding, reduced padding, pigment padding, pigment-pad jig reduction, vat-acid methods, vat-acid continuous method, high temperature continuous vat dyeing processes.

Avoiding acetate rayon saponification when dyeing with vat dyes

Marchington & Co. Ltd. Brit. P. 650,990. *Skinner's Silk & Rayon Rec. 25*, 830, 832 (June 1951).

This process of dyeing acetate rayon with an acid dye liquor containing the leuco form of a vat dye eliminates the saponification of the acetate rayon in the process. A dyebath is first made using a vat dye, caustic soda, sodium hydrosulfite, and a suitable dispersing agent; and before dyeing an organic acid, such as acetic or formic acid, is added to more than neutralize the alkali so that the free acid leuco vat dye is formed. One or more of the swelling agents: ethyl alcohol, di-

acetone alcohol, sodium thiocyanate, etc., is used to insure rapid dye pick-up at low temperature.

Cellulose acetate dyes

Y. Arnould & H. Wahl. *Bull. So. Chim. de Fr.* 7-8, 491-94 (1951); *in French.*

During a systematic study of relations between the constitution of insoluble dyes and their affinity for cellulose acetate, the synthesis of a series of monoazoic dyes was realized, differentiated by the number of fixed hydroxyethyl groups on the tertiary nitrogen. The preparation and properties of these dyes are described.

Cellulose acetate and vat dyestuffs

G. D. Sutton. *J. Tex. Inst. 42,* P538-P549 (Aug. 1951).

Traces the difficulties encountered in the dyeing of cellulose acetate during the War I years and the progress achieved by the use of vat dyes.

Color of organic compounds. IV — Indigo and related dyes

E. B. Knott. *J. Soc. Dyers Colourists 67,* 302-306 (Aug. 1951).

Shows that the application to the indigo molecule of known color rules leads to the expectation of deep color. Examines various isomers, analogues, and derivatives of indigo and thioindigo and explains their color on a qualitative basis.

Dyeing possibilities of Acrilan

J. A. Woodruff. *Am. Wool Cotton Reptr. 65,* 16-17, 54 (Oct. 4, 1951).

There are two means of eliminating the setting of wrinkles in the dyeing of Acrilan at the high temperatures which are necessary for good exhaustion and penetration. The first includes presetting the fabric by wetting it out at a temperature near 200° F., scouring it in open width, and then dyeing it in the rope. The second method includes rope-scouring the fabric, drying it in a loop dryer or clip frame, quick steaming in a semi-decator or in a steam frame to remove wrinkle marks, and dyeing in a dye beck. Some details of beck dyeing and jig dyeing Acrilan are described, and the effect of different types of dyes on Acrilan are listed. Notes are also given on package dyeing and stock dyeing.

Dyeing Terylene with azoic dyes

R. Hardwick, L. Wood & I. C. I. Ltd. Brit. P. 650,923. *Skinner's Silk & Rayon Rec. 25,* 826, 828 (June 1951).

A process for dyeing polyethylene terephthalate fibers with azoic dyes, made by coupling a

naphthol or similar component with a diazotised amine, consists of incorporating components of the dye in the polyethylene terephthalate melt. The naphthol component is added to the melt immediately before spinning, the fibers are then formed by a melt spinning process, and the fibers are then treated with a solution of a diazotised amine in order to bring about the coupling and dye formation within the fibers.

Effect of light on vat-dyed cellulose

A. Landolt. *Textile-Rund. 5,* 441-455 (Nov. 1950); *in German.*

A number of tests have been carried out on thirty-eight vat dyes in an attempt to assess the extent to which dyestuff constitution causes damage to cellulose fibers, and to study any accelerating or restraining effect of substituent groups in the molecule. The reactions of the parent substances of the dyestuffs under investigation indicate auto-photosensitization which can be modified by substituent groups or by a special molecular arrangement. It has been found that, under suitable conditions, vat-dyes can bring about both oxidation and reduction of cotton fibers under the action of light. An experimental technique, in which rapid alternation of these is secured, is described. There are extensive tables relating dyestuff constitution, tear-strength, reaction with hydrogen peroxide, "blue-test" results, and reflection of various wave-lengths.

Hand printing of textiles

E. S. Beton. *J. Tex. Inst. 42,* P550-P556 (Aug. 1951).

Traces the evolution of printing from its earliest primitive origins and compares hand printing with present day printing.

Instrumentation in dyeing

H. G. Olson. *Am. Wool Cotton Reptr. 65,* 13, 15, 110 (Aug. 23, 1951).

The proper control system for dyeing depends entirely on the type of dyeing and nature of the goods being dyed, and selection of the proper system is of major importance for good dyeing. In jig dyeing, an air-operated controller for temperature control will eliminate the over-peaking and unstable control line characteristic of off-and-on type control. In types of dyeing, such as raw stock dyeing, where controlled hold time and temperature are important, a temperature controller which is adjustable to the requirements must be selected. A cam-operated controller may be used where the same type of goods and dye are used time after time and the rate of rise, hold temperature

and time are controlled, but not changed. In job dyeing where a different dyeing schedule is used for each type of material a flexible time-schedule controller is needed. With this instrument, the rate of rise, dyeing temperature, and hold time are completely adjustable. For mills which desire centralized control of dyeing, the use of pneumatic transmission makes this type of control possible regardless of the type of dyeing or distance from the dye machine to the control panel.

A new continuous stock dyeing machine

Kenneth S. Campbell. *Textile Bull. 77,* 108 (Apr. 1951).

The Williams continuous fiber processing machine, developed by Sumner H. Williams, is designed for dyeing viscose staple and tow and cotton raw stock with all dyes ordinarily used; for dyeing acetate staple with acetate dyes, for wool raw stock scouring and stock dyeing with vat dyes; for dyeing Orlon fiber with vat dyes; and for dyeing staple nylon with vat and acetate dyes. The new machine has a very low liquor-to-goods ratio; controlled, rapid passage of goods through liquor; and thorough and uniform impregnation of goods with the treating solution. Treatments are carried out at higher than normal temperatures, at a faster rate, and goods are under no tension or restraint.

New dyeing techniques require automatic temperature control

Walter H. Ridley. *Am. Wool Cotton Reptr. 65,* 32-3, 91, 93, 95 (Aug. 23, 1951).

In the dyeing of synthetic fibers as well as other fibers control of temperature and exposure time are of utmost importance. This is particularly true in the dyeing of synthetics by new techniques involving high temperatures. By using the Cyclelog Controller, speed of temperature change can be automatically measured and controlled in dyeing. Applications of automatic temperature control to the new method of continuous dyeing using hot oil, to the Standfast molten metal method of continuous dyeing, and to the vat dyeing of wool at low temperatures are discussed.

New fibers expand pigment-resin applications

Jas. R. Redmond. *Am. Wool Cotton Reptr. 65,* 67, 69, 81-2 (Aug. 23, 1951).

Textile pigments are colored substances which for the purpose of application to textiles are insoluble in water and in oil and resinous media, and dyes that are applied from a system which is insoluble are also called textile pigments. Selection of a pigment for textile use is influenced by

the chemical constitution and particle size of the pigment, and the bonding agent used largely governs the fastness of pigment-printed and pigment-dyed fabrics to washing, dry cleaning, abrasion, etc. Synthetic pigments have been found to be superior to naturally occurring pigments in coloring textiles with frequently 2 or more synthetic resins used as bonding agents. Aridye registered pigment resin colors have found increasing use in printing cottons and rayons and in dyeing light to medium shades on cotton, rayon, acetate, nylon, orlon, and other fibers. Research is continually being done to increase the application of pigment-resin formulations to new fibers.

New process for dyeing glass fibers

J. Robert Bonnar. *Textile Industries 115,* 155 (Sept. 1951).

A process for dyeing of fibrous glass without reducing flame resistance and at the same time increasing the wash-fastness, abrasion resistance, and drapery qualities of the material has been developed through the research of General Dyestuff Corp., General Aniline & Film Corp., and the Owens-Corning Fiberglas Corp. By cross-linking methyl vinyl ether maleic anhydride copolymer with polyvinyl alcohol, the affinity of glass piece goods for vat pigments was developed. The process, known as Appretan PF, also was found to act as a binder for other film forming materials such as Teflon, which has been found to increase abrasion resistance without impairing draping.

Notes on silk dyeing. Part V

A. G. Tyler. *British Rayon & Silk J. 27,* 58-9 (May 1951).

Silk in yarn form is usually dyed with vat dyes while vat leuco esters are usually used for dyeing silk in the piece. Striped cloth of vat dyed yarn woven with undyed yarn can be effectively dyed with vat leuco esters where vat dyes would not give a similar result. This is due to the fact that the reducing agent necessary to prepare the dyebath would reduce the dye already on the dyed stripes. Application of vat leuco esters to silk is discussed.

In applying azoic dyes to silk the alkalinity of the impregnating bath must be kept at a minimum to prevent alkaline damage to the silk. A protective colloid should also be employed. Notes on the dyeing of silk with azoic dyes are presented.

Print works after-treatment factors

J. H. Downey. *Textile Age 15,* 58-61 (Sept. 1951).

The after-treatment which follows the fixation of colors in printing includes the development or oxidation followed by washing off of the goods for the removal of surplus thickening and dye. This after-treatment must leave the goods in the best possible condition for the final finishing treatment. Notes are given on the oxidation and washing-off of vat colors, vat color discharges, and chrome mordant colors.

Reduction of direct dyes during the dyeing of viscose rayon

W. Armfield. *J. Soc. Dyers Colourists 67*, 297-301 (Aug. 1951).

Shows that the cause of reduction of certain direct dyes during the dyeing of viscose rayon at temperatures near the boil is the presence of alkali. It is also shown that some direct dyes contain sufficient alkali to cause reduction of other direct dyes although they themselves may not be affected. Cites the influence of such factors as temperature, pH, addition of chlorides and sulfates on the reduction of direct dyes. Classifies a number of dyes and places them in four groups according to whether they show considerable, moderate, slight or no reduction.

Stencil printed rugs

Anon. *Dyer 105*, 757-9 (June 15, 1951).

Mohair pile motor rugs are formed from two lengths of pile fabric sewn together with the pile surface on each length facing outwards. Stencil-printed designs are usually used as decoration for the front side of the rug, termed the "face" or obverse side, with the rear half, termed the "back" or reverse side, left unstencilled. The pile on each half is supported by a cotton foundation usually woven from self- colored cotton warp and weft yarn. The mohair pile for the reverse half is colored by brushing on a thickened solution of dye instead of dyeing by the normal immersion process. Dyes used in the preparation of the stencil printing color include direct cotton dyes and commercial union dyes of the kind used for dyeing wool and cotton blends. Other dyes used occasionally include basic dyes, hematine crystals, cutch, etc. Thickeners used include farina, wheat starch, wheat flour, etc., all of which possess the additional property of helping increase the natural luster of mohair fibers when applied under the right conditions with the goods pressure-steamed while the pile fibers are heavily loaded with the thickener. The types of stencil plates used, making the stencils, and the method of using the stencil plates for mohair pile motor rugs are discussed.

Successful dyeing of Orlon acrylic fiber now possible

H. F. Clapham & D. E. Gamble. *Am. Wool & Cotton Reptr. 65*, 9-10, 51, 53 (Sept. 13, 1951).

Satisfactory dyeing is possible with both types of Orlon although dyeing of Orlon Staple is much simpler than Orlon continuous filaments. Unusual techniques are necessary, except for the light to medium shades, in applying acetate dyes to both types of Orlon; and acid colors can be applied to both types by the cuprous ion technique although modification of the technique is required for Orlon continuous filaments. Vat dyes can be applied to Orlon using modified techniques, and basic dyes also have been found useful. Limited use can be made of resin bonded pigments in dyeing Orlon. The new techniques used in dyeing Orlon are described with particular attention paid to the cuprous ion technique. Dye formulas are also given with some results obtained from the dyeings presented.

Vistas in printing research

Anon. *J. Tex. Inst. 42*, P557-P578 (Aug. 1951).

Cites the differences between printing and dyeing and describes some of the processes used in printing. These include making the impression, drying and steaming. Discusses some of the chemical reactions in printing and the migration of the printing dyes.

Water-insoluble printing pastes

C. Bener. Brit. P. 651,324. *Brit. Rayon & Silk J. 27*, 78 (May 1951).

The thickener in this printing paste consists of boiled linseed oil to which chalk or alumina have been added to give body. A treatment in wet steam for about an hour will cause the dye in the final mixture to migrate to the fibers and be fixed there. This treatment can be made even more effective by the incorporation of glycols or glycerol so as to give a paste midway between the soluble and insoluble types.

Dyehouse built for control

Staff. *Textile Industries 115*, 125-129 (Nov. 1951).

See front section.

SPECIAL FINISHING F

Aim of durability in modern finishing

P. T. Gale & R. J. Smith. *Dyer 105*, 827 (June 29, 1951).

Today finishers aim at serviceability, increased

utility, and enhanced value for fabrics rather than purely effect. Chemical modification of fibers has given an approach to these aims. Among the difficulties found in finishing hydrophobic fibers, such as nylon, is their limited capacity for taking up finishing agents from aqueous dispersions or solutions. The development of silicones have given a partial solution to this problem. New methods of heat treating and chemically modifying nylon have also opened new fields for the use of this fiber. In considering the subject of cleansing, the use of carboxy methyl cellulose as a detergent additive to give a reduction in soil redisposition is of importance. The action of carboxy methyl cellulose is discussed.

Anti-static finish for nylon

Brit. Nylon Spinners and G. H. L. Andrew. Brit. P. 649,877. *Brit. Rayon & Silk J. 27*, 76 (May 1951).

This hydrophilic liquid which is said to completely eliminate static charges and is easily removed by scouring consists of a liquid glycol, particularly diethylene glycol, containing small amounts of water and sodium chloride. The liquid is applied to the yarn by any finishing means.

Application of D.D.T.

H. T. Fergusson, R. Williamson, and Geigy Co., Ltd. Brit. P. 650,403. *Dyer 105* (June 15, 1951).

Textiles can be more effectively impregnated with D. D. T. and other insecticides by using the following dispersion: The insecticide is first dissolved in an organic solvent, rendered polar by the addition of a fatty acid having more than 12 carbon atoms in the molecule, such as oleic acid, and then dispersed in an aqueous organic acid solution of casein or blood albumen to positively charge the solution. Advantage is taken of the fact that when the pH of a colloidal protein is brought below its iso-electric point its charge is reversed from negative to positive. Thus the casein or blood albumen is first dissolved in an alkaline solution to which is then added sufficient organic acid to overcome the alkalinity and give a pH of 3.5-4.5.

Birch Bros. announce new quetsch

Anon. *Am. Wool Cotton Reptr. 65*, 21 (Oct. 4, (1951).

A new quetsch or padder, made by Birch Bros., Inc. has a capacity up to 15 tons pressure, application of which is through air cylinders exerting pressure on the top roll through levers. A stainless steel tank on the entering end is fitted with an apron to catch the liquor from the squeeze

rolls, and a partial steam jacket keeps the liquor at the desired temperature.

Chemists overcome new fiber finishing problem

Anon. *Am. Wool Cotton Reptr. 65*, 75, 77 (Aug. 23, 1951).

Problems of slippage control, delustering and hand encountered in the processing of new synthetic fibers have been overcome by the use of Syton, a colloidal dispersion of silica particles in water. When these silica particles are deposited on smooth, slippery filaments, the surface becomes roughened with the result that: interfilament friction is increased, decreasing slippage; light rays reflected from the smooth polished surface are broken up by the particles, reducing sheen or luster; and the surface is modified by the particles so that the feel or hand of the fabric is dry and frictional rather than smooth and oily. Syton also can be used in combination with other finishing agents to give new and interesting finishes. It is not expensive to use and needs no special handling, curling or after treatment.

A finisher surveys modern processing techniques

Wm. F. Brosnan. *Am. Wool Cotton Reptr. 65*, 87, 89, 97 (Aug. 23, 1951).

Dyeing techniques for acetate fabrics, acetate-viscose blends, nylon, acrylic fibers, Dacron, Fiberglas, Vicara, etc., are briefly reviewed, and the problems encountered in the finishing of these fibers are discussed.

Finishing research vital to synthetic acceptance

Anon. *Am. Wool Cotton Reptr. 65*, 27, 29, 31 (Aug. 23, 1951).

Synthetic fiber development has depended greatly on the progress made in fabric finishing. As the special needs of the various synthetics have arisen, new finishes and specialized applications of these finishes have been developed. Examples of some of these finishes are discussed, and a series of photographs to illustrate the progress in finishing research is presented.

Flameproofing textiles

Anon. *Am. Wool Cotton Reptr. 65*, 20 (Aug. 9, 1951).

Heavy duck, tenting, awnings, and other fabric where "hand" is relatively important can be satisfactorily flameproofed by treatment with antimony oxide and chlorinated paraffin. Fabrics such as cotton sheeting, chenille yarn, twills, etc., can be satisfactorily flameproofed by impregnating them with titanyl chloride plus antimony tri-

chloride followed by neutralization with an alkali. Another development in flameproofing is "Erifon," a flame retardant consisting of an aqueous solution of inorganic salts containing free hydrochloric acid with titanium and antimony as the active flame retarding constituents. Fabrics flameproofed with Erifon have a hand about the same as the untreated fabric but its dye affinity is altered.

Flameproofing textiles

J. Bancroft & Sons Co. (to A. H. Stevens). Brit. P. 649,642. *Dyer 105,* 722 (June 15, 1951).

This flameproofing process for textiles is claimed to safeguard the handle and strength of the fabric, resist washing and drycleaning, and to give cellulose fabrics a mildewproof finish. The fabric is impregnated with an aqueous solution of a mixture, or reaction product of (1) water soluble acid of phosphorus or sulfur which is free from metal, from organic groups and from constituents yielding active oxygen and halogen and which is substantially non-volatile under the conditions of the process, or a suitable salt; and (2) at least one non-metallic nitrogen-containing organic compound basic with respect to the acid solution and soluble in it, which has an atomic ratio of carbon to nitrogen of not more than 2 to 1. The material is dried and then heated to between 400 and 250° F. for from 30 sec. to 120 min. The solution is such that the pH of the heated material before final washing is between 3 and 6. Conditions of the process are correlated to form with the material a complex containing an amount of acid-forming element of the acid equivalent to from 1 to 5% of phosphorous or sulfur and to introduce into the complex from 0.25 to 6% nitrogen, both by weight of the finally washed and dried material.

Launderability

F. R. Hill. *J. Tex. Inst. 42,* P847-P856 (Aug. 1951).

Improvements in fabrics, fibers, dyes, use of pre-shrinking treatments and their relationship to improved laundering characteristics are discussed.

A million little razor blades

Arthur R. Wachter. *Am. Wool Cotton Reptr. 65,* 35 (Aug. 23, 1951).

With the improper application of urea-formaldehyde and melamine resins to rayon, the resistance of a fabric to abrasive wear is reduced to a small percentage. After resination a fabric

should retain two-thirds of its original strength and should have almost the same hand after it is handled by the cutters as before. Each fabric should be studied to determine the amount of resin required since each fabric requires a different amount. Improper resination tends to deposit resins on the surface of the goods instead of impregnating its interior surface. Too quick drying of resinated fabrics also results in crystalline deposits on the fabric. In addition, resinated fabrics should run through all operations without any tension, and careful attention should be given to both pH and temperature.

New pre-shrunk process

Anon. *Am. Wool Cotton Reptr. 65,* 23, 25, 96 (Aug. 23, 1951).

The Carter-Set process is a new shrink-proofing process to eliminate lengthwise drag and the removal of tensions placed in knit goods by prior manufacturing steps. Controlled heat and humidity and constant monitoring of each step during product manufacture are used. The process starts with preselection of fabrics to be preshrunk since all fabrics cannot be shrunk. Certain modifications of the fabrics such as changing yarn count, stitch count, and knitting width are then made. Fabrics are then dried under controlled conditions at low constant heat; conditioned in temperature and humidity-controlled rooms to insure the relaxed loop structure; and pre-shrunk on the Tube-Tex tensionless calendering machine with humidity provided by inducing steam through the fabric by high-speed jets. After the fabric has been run on the Tube-Tex machine, five other steps are performed to avoid putting tensions back into the fabric after it has been relaxed. Cotton, spun nylon, spun Orlon, and mixtures of cotton with other fibers, such as wool can be processed by this method.

Water-repellency of textiles — past developments and future prospects

T. R. Harding. *J. Tex. Inst. 42,* P691-P702 (Aug. 1951).

The author discusses the various types of water-repellent compounds which are and have been used. These include (1) aluminum compounds, (2) zirconium compounds, (3) fats and waxes, (4) proteins, (5) compounds capable of entering into chemical combination with textile fiber substance and (6) synthetic compounds of high molecular weight.

Textile Institute Conference

Anon. *Dyer 105,* 763-8 (June 15, 1951).

Summaries of those papers which are of most

direct interest to the dyeing, printing, and finishing industries presented at the Textile Institute's 1951 conference are presented. The papers include: "Vistas in Printing Research" by H. A. Turner; "Vat Dyes on Acetate Rayon—Workable Processes Developed" by G. D. Sutton; "Future of Water Repellent Finishing" by T. R. Harding; "Hand Printing" by E. S. Beton; "Developments in Mechanical Finishing" I. Wool by C. S. Whewell, II. Cellulosic Materials by H. A. Turner; "Trends in Textile Drying" by F. W. Thomas.

Water-proofing compounds

Wingfoot Corp. Brit. P. 649,094. Dyer *105*, 832 (June 29, 1951).

Fabric water-proofing methods are claimed in which coating compositions are compounded with large proportions of a hydrophilic diatomaceous earth; e. g., infusorial earth, diatomaceous silica, or Kieselguhr, available under the trade names of "Sil-o-cel," "Celite," and "Superfloss." Anti-oxidants, accelerators, plasticizers, and coloring agents may be added in the usual way.

Year sees textile finishing make record accomplishments

Anon. *Am. Wool Cotton Reptr. 65*, 11-12, 62-3 (Aug. 23, 1951).

The progress made in processing fibers, dyeing methods, and machine developments in the past year is reviewed. Some of the developments mentioned include: the use of synthetic resins for producing stiffness, weighting and resilience, porosity, etc. on fabrics; the Williams machine for continuous dyeing or other processing of fibers, stock or staple; vat dyeing using molten metal as the color fixation medium, etc.

New finish increases wear life of rayon

Anon. Dan River Mills Release No. *9* (Nov. 9, 1951).

See front section.

TESTING AND MEASUREMENT G

Clothing and fabrics G 1

Uses and limitations of textile testing

J. Pollitt. *J. Tex. Inst. 42*, P754-P770 (Aug. 1951).

Article deals primarily with the technical aspects of testing, but also discusses the economic incentives. Considers methods of test and the nature of appropriate standards in relation to the purposes for which tests are undertaken. Classifies the various applications of textile testing and attempt to show to what extent these are or can be fulfilled. Generally deals with the subject on a broad basis and introduces specific examples to illustrate general principles.

Instruments and instrumentation G 2

Device for counting defects in yarn

Buck Gunter. *Daily News Record*, 1 (Oct. 15, 1951).

See front section.

Devices developed to evaluate "hand" and yarn stiffness

Anon. *Daily News Record*, 38 (Oct. 22, 1951).

See front section.

Fabric friction

Peter M. Kormos. *Rayon & Syn. Tex. 32*, 31-2, 80-81 (Oct. 1951).

In order to determine friction within a fabric an apparatus was designed to simulate existing conditions in the fabric as closely as possible. The apparatus measures the force necessary to cause a movable vertical yarn to slip on the surface of a horizontal yarn. Graphs are given showing the relationship between the load necessary to move the yarn and the frictional resistance.

Instrument for measuring elasticity and elastic recovery of textile fabric

A. M. Hansen and H. M. Fletcher (dedicated to the free use of the people of the United States), USP 2,568,731, Sept. 25, 1951.

An instrument for testing the elasticity and elastic recovery of a fabric comprises a frame, mountings for holding a rectangular piece of fabric to be tested along crosswise and lengthwise edges, and two carriages to apply stretch and elastic recovery of the fabric along the edges. Means are applied releasing a force to each of the carriages in the direction of its movement, and means for measuring the force, whereby the fabric may be stretched and allowed to recover simultaneously in both its crosswise and lengthwise directions and the elasticity and elastic recovery determined by observing the amount of stretch and recovery.

Instrument for studying drape

Simon Williams. *Textile Industries 115*, 170, 173, 175 (Sept. 1951).

A test for drape must not only include a measurement of the bending or stiffness of a fabric, but must also measure the tendency of the

material to change from a flat state to a condition in which loose folds may occur. Any measurement of drape must be able to relate fabric weight, the potential range of fabric use, and the actual unit measurement taken directly from the tester. A drapemeter, developed by Fabric Research Laboratories, is proving itself extremely useful in detecting differences not readily apparent to the expert in terms of qualitative standards of drape and hand. Results obtained with this tester give excellent correlation with opinions of men in the field, but improvements are constantly being made since the Drapemeter is still far from a perfected instrument. A working model of the instrument and a schematic plan of its parts are illustrated, and the procedure of its operation is described.

Shrinkage of crepe yarns during de-sizing

J. Henno & R. Jouhet. *Bull. L'Inst. Textile de Fr. 17,* 55-56 (1950); *in French.*

The authors describe an apparatus recording the shrinkage and speed of shrinkage values of crepe yarns during de-sizing.

Testing — and its uses in better manufacturing

Dame S. Hamby. *Textile Bull. 77,* 66-71, 73 (Apr. 1951).

This paper on testing which was featured at the spring meeting of the Southern Textile Association's Eastern Carolina Division is presented together with the resultant floor discussions. The Pressley fiber tester, Fibrograph, Micronaire, moisture tests, card room tests, evenness testers, spinning room tests, and fabric testing are included in the discussion.

TEXTILE MILLS H

American Association of Textile Chemists & Colorists 30th annual convention

Anon. *Am. Wool Cotton Reptr. 65,* 15, 55-61 (Oct. 4, 1951).

A listing of the exhibitors at the 30th annual textile exposition of the AATCC is given together with notes on their exhibits.

Angle of torsional rupture

Paul-August Koch. *Textile-Rund. 6,* 281-5 (June 1951); *in German.*

The new method for the measurement of the angle of torsional rupture of fibrous materials is applied to various kinds of rayon and synthetic fibers. Tests show that this angle discloses differences in fiber structure brought about by variation in production methods, particularly in

stretching. Values for the angle of break are given for various rayon and synthetic fibers and filaments, and variation in properties with degree of stretch is demonstrated by a series of tests on similar fibers.

Claims wool goods future hinges upon quality control

Anon. *Am. Wool Cotton Reptr. 65,* 13-14, 56-7 Sept. 13, 1951).

A report on some of the talks given at the recent conference of the American Society for Quality Control includes: the importance of statistical quality control, the quality control program of Saco-Lowell, and the integration of statistical analysis with a mill's testing set-up.

Cranston Print is ultra-modern

Anon *Am. Wool Cotton Reptr. 65,* 16-17 (Aug. 30, 1951).

The new finishing plant of the Cranston Print Works is described. U-shaped operation is utilized at the plant resulting in a minimum of trucking and handling except that necessary at the machines themselves.

Delaware Mills — a lusty young enterprise

Anon. *Am. Wool Cotton Reptr. 65,* 11-12, 15, 17, 23 (Aug. 16, 1951).

In only two years time Delaware Mills, pioneers in the application of the Perlock machine and the Pacific Converter for producing spun nylon staple yarn, has enlarged to almost twice its wartime capacity — the one-time Norden bombsight building of World War II. Nylon top and yarn are produced directly from continuous filament 200,000 denier tow, skipping the traditional carding and combing steps in a structure equipped with the most modern air-conditioning. A brief history of the company and its operation is presented.

Electric feedrail

Staff. *Textile Industries 115,* 133 (Sept. 1951).

By using 4 parallel feedrails suspended from the ceiling at Summit Mills Corp., rapid relocation of machinery for any layout is possible without seriously interrupting production, and maximum flexibility in determining the proper machine location for a particular garment is permitted. Advantages realized from use of this installation include continuous flow of knitted articles through the finishing department, economy of machines and sewing personnel, and balanced production.

Fenner Taper-Lock Bush uses no keyway

Anon. *Textile Weekly 48,* 878 (Sept. 28, 1951).

See front section.

Frenzl-Hahn Universal yarn testing machine

Wolfgang Bobeth. *Melliand Textilber. 32,* 271-76 (1951); *in German.*

The manifold applications of the Frenzl-Hahn Universal yarn-testing machine are described. This apparatus determines the extensibility, regularity and elasticity of the thread, and indicates periodic changes in tension, treatment effects, friction, periodic recurrence of faults and properties in the wet state. Breaking tests may also be carried on this machine. Procedures for correcting results given by the running extension tests, and the importance of this test, are discussed at length. The arrangement of the machine is shown diagrammatically.

Lubrication of textile machinery. Part I

Bruce M. Dunham. *Textile Age 15,* 24-33 (Sept. 1951).

Problems in the textile industry caused by improper lubrication include: material spoilage, excessive wear on machine parts, high rust and corrosion of machines operating under high humidity conditions, difficulty in lubricating equipment operating under high temperatures, bad "housekeeping" caused by excessive drippage and "fly", stocking too great a number and variety of lubricants, etc. The use of proper lubricants or the adoption of better appliance methods could minimize or eliminate these problems..

The various equipment utilized in the manufacture of woolens and in the manufacture of worsteds up to and including weaving are shown in flow charts. Each table shows the method of applying lubricants generally used, together with the types of lubricants currently being employed for each part of equipment. A discussion of the problems involved in lubricating this wide variety of equipment is presented.

Materials handling

Anon. *Am. Wool Cotton Reptr. 65,* 19-20 (Aug. 9, 1951).

Some of the latest methods of materials handling are in use in the new warehouse of the Apponaug Co. At this finishing plant, gray goods enter the building down a gravity chute and conveyor where fork-lift electric trucks stack the goods. An electric and gravity conveyor is employed for transporting finished goods through invoicing, weighing, and steel-strapping. A card

index is used and invoicing is done by machine.

A message from a mill president to employees

Walter Regnery. *The Joanna Way 2,* 9 (Oct. 1951).

See front section.

A modernized cotton mill — Kendalls Oakland Plant

W. A. Thomason, Jr. *Textile World 101,* 126-29 (Oct. 1951).

See front section.

Modernized power plant gives more economical service

Miles Sampson. *Textile World 101,* 121-22 (Oct. 1951).

The post-war boiler-plant program at Mount Hope Finishing Co., North Dighton, Mass., included the following improvements:

1. New boilers of capacity sufficient to deliver all steam necessary for power generation even with one unit out of service. This meant three units of 50,000 lb. per hr. each. The design conditions covered all the pressure the old turbines would stand (200 psi), plus 100° F. superheat at the throttle.

2. A simple boiler-plant layout in the existing buildings, oil-fired, without air heaters, and relying on the existing 200x12-ft. stack for natural induced draft. Operation of the boiler plant by two men per shift was required.

3. Elimination of the 100-psi steam service, replacing the nine 45-yr.-old horizontal-return tubular boilers with three Babcock & Wilcox type-FF boilers. The six old Heine boilers retained in service were held for operation at 125 psi. for process work and for steam-engine power during emergencies. Four of these boilers, originally operated at 175 psi., are, of course, available for 125-psi. operation.

4. Modernization of feed-water heating and deaeration, water conditioning, and control.

5. Concentration of process-water heating by exhaust steam at the boiler house.

Photos show the safe way 1.

Staff. *Textile Industries 115,* 128-9 (Sept. 1951).

Photographs used at C. H. Masland & Sons carpet plant to show employees the right and wrong way to handle materials, equipment, etc., are presented.

Recent progress in statistical quality control in the textile industry

N. L. Enrick. *Textile Age 15,* 48-51 (Sept.

1951).

Statistical methods of control are especially suitable to the textile industry because of its continuous process-to-process variations. The system covers that part of variations in processing which cannot be ascribed to a specific cause and provides so-called control limits while at the same time indicating how to maintain the minimum required testing frequencies and sampling. A discussion is given of the 4 principal statistical applications: analysis of variance, control charts, sampling plans, and correlation study.

Rope

W. A. Kenyon. *J. Tex. Inst. 42,* P502-P520 (Aug. 1951).

In tracing the development of rope making from approximately 2500 B. C. to the present, the author cites the uses of ropes for industrial and marine purposes and describes the methods of using ropes for power transmission. Finally, discusses the testing of ropes for fatigue and abrasion resistance.

Setting a work load. A case study

Nathaniel M. Mitchell. *Textile World 101,* 109-16 (Oct. 1951).

See front section.

The Southern Mill's master mechanic now runs an engineering department

Jas. T. Meador. *Textile Bull. 77,* 185-6, 188, 190 (Mar. 1951).

A 40-year review of electrical modernization in textile mills.

Textile machinery on exhibition. Part 2. More news from Basle

Anon. *Brit. Rayon & Silk J. 27,* 62-6 (May 1951).

Descriptions of some of the textile machinery shown at the Basle Fair are presented. Included are such machines as the Beninger new sectional warping machine, the Zellweger yarn strength and elongation testing machine, the Nimatex fabric inspection machine, the Rieter cotton type ring spinning frame, etc.

Toxic or irritating fabric

Louis C. Barail. *Rayon & Syn. Tex. 32,* 59-61 (Oct. 1951).

The toxic effect of some chemicals used in the following processes are discussed: Dyes, bleaches, mordants and fixatives; plain finishes; finishes for resistance against: shrinkage, mildew, moths, water, flame, fire. Also considered are the mechanical irritations caused by the fabric themselves.

Tramrail with cantilever

Staff. *Textile Industries 115,* 165 (Sept. 1951).

At Gerrish Milliken Mills metal columns supporting the roof are located in one of the loom aisles and made loom beam handling impossible in this aisle with a standard overhead crane-and-hoist system. By use of a new type tramrail carrier with a special cantilever feature this problem has been solved. The girder of the crane supporting the hoist is made short enough so that it misses the vertical columns in moving up and down the aisles, and a special hoist on an extension boom is provided on the bridge girder for reaching out several feet beyond the end of the bridge girder itself. The special hoist and cantilever boom are rolled back under the main bridge when the loom beam is carried down the aisle.

Use and misuse of electrical equipment in cotton mills

Swaffield Cowan. *Textile Bull. 77,* 109-10, 112 (Apr. 1951).

The increase in cotton mill fires in recent years is believed to be largely due to the misuse of electrical equipment. Examples cited of this misuse include: the use of splash-proof motors in dry, linty locations where totally enclosed non-ventilated or textile type motors should be used; the use of antiquated, obsolete, and deteriorated electrical equipment; and the installation of spark producing equipment, such as starters, contactors, etc., when housed in enclosures which are designed not to confine sparks or exclude lint. Other sources of damage from the misuse of electrical equipment are also discussed.

Wedhadkee Yarn Mills' gas fired automatic steam generator

Staff. *Textile Industries 115,* 113-4 (Nov. 1951).

See front section.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS I

Absorption of sodium hydroxide by celluloses

K. Lauer. *Die Makromolekulare Chemie 7,* 5-11 (July 1951); *in German.*

By measuring the amount of NaOH taken up by cotton cellulose and mercerized cotton cellulose respectively and by determining the heat evolved, using caustic soda solns. between 21 and 40% by wt. a complete thermic analysis of the reactions

involved was possible. The heat evolved in the reactions between certain positions of cellulose and water or NaOH respectively could be determined also.

Action of light on nylon

R. G. Desson, H. R. Hadfield, L. Wool, & I. C. I. Ltd. Brit. P. 649,481. *Dyer 105*, 831 (June 29, 1951).

The light degradation of nylon textiles, especially those containing a delustrant, may be reduced by treating the nylon yarn at elevated temperature first with an acidified aqueous solution of a water-soluble dichromate, and then with an agent capable of forming chromic ions from this by reduction. The pH of the solution should not be reduced below about 2.5, otherwise there is a risk of hydrolytic degradation of the nylon materials.

Ageing of alkali cellulose

Courtaulds Ltd., D. Entwistle, E. H. Cole, & N. S. Wooding. Brit. P. 651,304. *Brit. Rayon & Silk J. 27*, 78 (May 1951).

Three groups of compounds are claimed which are suitable for preventing depolymerization during the ageing of alkali cellulose so that a viscose of higher viscosity is obtained. These groups include aromatic amines containing sulfonic acid groups; quinones; silver hydroxide with the latter being especially useful. Depolymerization is said to be prevented completely by the presence of 0.05% of silver in the caustic solution used for steeping.

Barium number determinations

Sidney M. Edelstein. *Rayon & Syn. Tex. 32*, 62-4 (Oct. 1951).

Barium number determinations are considered to be the most practical means of determining the degree of mercerization. Unmercerized cotton is characterized by a Ba no. of 100; mercerized cloth, 116-30; mercerized yarn, 150-160.

Cold spinning of vinylidene chloride polymers

Firestone Tire & Rubber Co. Brit. P. 649,539. *Brit. Rayon & Silk J. 27*, 76 (May 1951).

A process for the cold spinning of vinylidene chloride polymers consists in feeding the amorphous polymer as a monofilament or rod into a tapered die. The feeding mechanism is a pair of rotating rolls between which the rod passes. Another pair of rolls, which rotate faster than the first, are provided at the outlet side of the die for drawing the filament through. An upper limit of 170°C. to the temperature of drawing is recommended.

Degree of polymerization of cellulose. Causes of errors in determinations by the viscosimetric method

A. Parisot & J. Cyrot. *J. Tex. Inst. 42*, P783-P797 (Aug. 1951).

Discusses a method of evaluation of the degree of polymerization of celluloses with high molecular weights. Such determinations are made by measuring the specific viscosity of solutions of cellulose in cupri-ethylene diamine. Cites precautions and controls required to obtain precise data.

Deposition of polymers with cellulosic fibers

G. Landells & C. S. Whewell. *J. Soc. of Dyers & Cols. 67*, 338-4 (Sept. 1951).

Using thermal and free-radical polymerization techniques, conditions have been worked out for the deposition in considerable quantities, inside cellulosic fibers, of vinyl polymers derived from monomers both readily soluble and almost insoluble in the aqueous reaction medium.

Detergent power of chemical agents

Marc. Ringeissen. *Teintex 16*, 219-226 (1951); *in French.*

Details are given for testing the detergent power of water-soluble chemical agents. The two principal methods are optical and gravimetric. Considerable attention is paid to application of "soil" mixtures to fabric so as to reproduce normal conditions.

Economical hand treatment machines

A. Ashworth. Brit. P. 649,665; 648,971. *Dyer 105*, 770 (June 15, 1951).

In Brit. P. 649,665 a machine for treating hanks of yarn with liquid is claimed to give even treatment and economy in the use of water. The treatment chamber in the machine is wider at the top with two shelves formed extending from front to back. Above these a gauze bottom tray is mounted on bars with spray nozzles provided above the tray. A sump in the bottom is provided for draining off or recirculating the water. Rods above the shelves hold the hanks of yarn.

In Brit. P. 648,971 a machine for quickly and economically drying yarn is claimed. Heating means such as steam pipes connected to a source of supply are provided at the bottom of the chamber of the machine, and at the top there is an extractor fan, a vacuum gauge, and a moisture indicator. Rails extend from front to back, and on these rods carrying the hanks of yarn are laid. The yarn is packed up tightly so that it divides the chamber into two parts.

Emulsion Xanthation of cellulose

F. Gartner & O. Samuelson. *Svensk Papperstidning 54*, 588-90 (Sept. 15, 1951); *in English.*

A study of the intracrystalline swelling of the undissolved residue obtained in emulsion xanthation under conditions of incomplete dissolution is presented. The undissolved residue has been treated with acid in order to split off the xanthate groups. After washing and drying the x-ray diagram has been taken in order to establish if any transformation of the cellulose has taken place.

Estimation of the carboxylic acid group in cellulose

J. Farrar, S. M. Neal, G. R. Williamson. *Nature 168*, 566-7 (Sept. 29, 1951).

A brief note describing a new method for the gravimetric estimation of the carboxylic acid groups in cellulose in which the material is soaked in a saturated solution of uranium acetate in water over-night, very thoroughly washed, oven-dried and weighed, ashed at 700°C. and the ash weighed as U_2O_5. Cellophane data included.

Investigations of degree of crystallinity of cellulose fibers

P. H. Herman. *Textile Mfr. 77*, 253 (1951).

Chemical methods are not as satisfactory as x-ray methods. Crystallinity of fibers like cotton, flax, and ramie is higher than rayon. Degree of crystallinity of regenerated cellulose did not show variation. It may be said quantitative differences in the over-all x-ray diffraction of fibers have been detected and measured. (An abstract of a paper presented before the Soc. Dyers and Colorists.)

Morphology of cellulose and its derivatives

Magda Staudinger. *Die Makromolekular Chemie 7*, 70-81 (1951); *In German.*

The microphotographs of natural and nitrated fibers of normal and degraded cellulose and the formation of cracks in them are demonstrated. Regenerated cellulose fibers were shown to behave different from natural cellulose fibers.

Spinning young viscose

Am. Viscose Corp. Brit. P. 658,865. *Brit. Rayon & Silk J. 27*, 76 (May 1951).

Viscose yarns of high tenacity, high extensibility, and abnormally high flexing life may be produced from unripened viscose consisting of highly xanthated cellulose with a high salt test value. The young viscose used may contain be-

tween 4 and 13% caustic soda with the cellulose content between 7 and 8%. The constituents of the spinning bath include sulfuric acid and sodium sulfate together with a multivalent metal sulfate. The sulfuric acid must lie between 1.2 to 2.0 times the percentage of sodium hydroxide in the greater than 21 plus 0.66 by concentration of sodium hydroxide in the viscose. In addition, the metal sulfate must comprise at least 18% sodium viscose, and the soluble metal sulfates must be sulfate and at least 1% zinc sulfate. The threads are stretched 90-110% after leaving the spinning bath, which is at 45-50°C.

Static on nylon

G. H. L. Andrew and British Nylon Spinners Ltd. Brit. P. 649,877. *Dyer 105*, 771 (June 15, 1951).

Processing troubles due to the accumulation of static electricity on synthetic linear polymer yarn is said to be reduced by applying a solution of sodium chloride in a hygroscopic liquid polyhydroxy aliphatic organic compound of low volatility, e.g. diethylene glycol.

The ultraviolet absorption spectra of cellulose acetate

V. Keussler, R. Meck & A. Sippel. *Die Makromolecular 7*, 62-69 (1951); *in German.*

The ultra-violet absorption spectra of fractionated cellulose acetate of varying degrees of polymerization were measured. In the region between 3000 and 3700 A the absorption coefficients were found nearly linear to the wave-length of the light absorbed. The change of the absorption coefficient with increasing wave-length is nearly the same for different degrees of polymerization.

Viscoelastic properties of high polymers

M. Horio, S. Onogi, C. Nakayama & K. Yakamoto. *J. of Applied Physics 22*,966-70 (1951).

Viscoelastic properties were measured by means of the vibration reed method at 20 to 100 c/sec. The materials were viscose monofilaments of various degrees of orientation, and films of "cellophane", celluloid, cellulose acetate, polycaprylolactam, and polyvinyl chloride. The two latter differed noticeably from cellulose in dynamic properties, presumably because of absence of crystallization.

TEXTILE EDUCATION AND RESEARCH J

Clemson School of Textiles

Anon. *Textile Age 15*, 44-7 (Sept. 1951).

The Clemson School of Textiles, founded in 1898, is one of the earliest schools to give college degree work in textiles and through the years has rendered a wide service to the textile industry by training men for all levels. The school is divided into 5 departments: Yarn manufacturing, Weaving and design; Textile chemistry dyeing and finishing; Knitting; and Textile Management. Descriptions of these various departments are given.

Cotton Research of past is paying dividends today

Anon. *Southern Textile News 7,* 33 (Oct. 27, 1951).

Research done on cotton, as well as other textile fibers, during World War II is paying dividends today.

There are numerous research organizations operating today in behalf of the textile industry. Among them are the Institute of Textile Technology, the Southern Regional Research Laboratory, the Cotton Textile Institute, the Callaway Institute, Inc., the Southern Research Institute, and a number of others including laboratories in several of the nation's institutions of higher learning.

Every mill should have a research evaluator

Giles E. Hopkins. *Textile World 101,* 131, 258, 262 (Oct. 1951).

See front section.

How research serves mills and markets

Robert C. Jackson. *Textile Bulletin 77,* 65-66, 68, 70 (Sept. 1951).

See front section.

Industrial research and the consumer target

A. G. Ashcroft. *J. Tex. Inst. 42,* P805-P819 (Aug. 1951).

In this article the author considers the pattern of industrial research and its organization and the importance of consumer reaction on research programs.

Research advances textiles to points of higher use

Anon. *Am. Wool Cotton Reptr. 65,* 51-2, 56 (Sept. 20, 1951).

Subjects discussed at the textile symposium of the Diamond Jubilee meeting of the American Chemical Society include: liveliness in fabrics and yarn and machines developed for measuring this factor, the luster of cotton, the effect of retardants on fabric combustion, insulation by metallic finish, stabilization data, etc.

Textiles — their past, present and future

Anon. *Skinner's Silk & Rayon Rec. 25,* 742, 746, 749-50 (June 1951).

Highlights of the papers read at the Textile Institute Conference at Brighton are reviewed. Silk, rayon, and other synthetic fibers and their processing are discussed.

Trends in wool research

R. J. Bray & E. G. Carter. *J. Tex. Inst. 42,* P361-P384 (Aug. 1951).

The author discusses many aspects of wool research. First the structure of the wool fiber as revealed by chemical and x-ray techniques is described. Next some of the physical properties of the wool fiber are presented. Finally, some trends in applied research, in which progress in scouring, carding, combing, spinning, etc., are cited.

Whitin's research and development division in new and larger quarters

Anon. *Textile Bull. 77,* 77-8, 80 (Apr. 1951).

The research, experimental development, and textile laboratory testing divisions of Whitin Machine Works have been consolidated into one completely equipped building to provide increased efficiency and to enlarge the scope of operations. A description of the new building is presented together with an outline of the range of machinery. Objectives of the various departments are also discussed.

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12

Operation of Standards Department, Effect of Fiber Fineness on Yarn Strength, and New Devices Feature December Technology

THIS IS THE WAY WE MAKE OUR CLOTH

The work of the Standards Department of Joanna Cotton Mills, Joanna, S. C. was summarized in a feature story as follows:

1. Everything from raw cotton, straight from the bale, to finished product is tested at Joanna.

2. Each bale of cotton is checked for staple length and grade. The Micronaire is used to determine the fineness or the weight per inch of the fiber. Fifty grains of cotton are carefully weighed out and placed in the small chamber on the front of the Micronaire. An accurately measured pressure of compressed air is blown through the cotton sample. The float in the pressure column rises and falls with the variation in pressure caused by the different samples. A calibrated scale alongside the float is graduated in fiber fineness. The bales are separated in the warehouse according to their fineness and are blended in the opening room to insure a constant average fineness in the picker lap.

3. The Pressley machine is used to test the breaking strength of the fibers. After breaking, the fibers are weighed on a very sensitive balance and the breaking strength in pounds per square inch is calculated. This year's crop is breaking about 80,000 pounds per square inch.

4. Each day a number of cards are checked for neps per 100 square inches of web, fly waste and flat waste.

5. The Saco-Lowell Sliver Tester is used for routine checks on Card and Drawing sliver.

6. Sliver, roving, and yarn are tested on the ITT Brush Uniformity Analyzer. The instrument was developed by the Institute of Textile Technology.

7. The Analyzer electronically weighs inch increments of the sample being tested. A graphic chart is made on the recorder. The peaks indicate heavy places in the yarn, the valleys are thin places. By suitable calculations, the percent non-uniformity of the sample can be determined from these charts.

8. To save time in evaluating the charts, the Automatic Evaluator was developed. The evaluator is calibrated in percent non-uniformity and this percentage may be read directly while the sample is being run on the Analyzer. To run 100 feet of sliver, 100 feet of roving, and 1,000 feet of yarn and determine the percent non-uniformity, or % NUE, takes about four minutes each. (*The Joanna Way*, November 1951, pp. 13-15).

FIBER FINENESS IS IMPORTANT FACTOR OF TWIST REQUIRED FOR MAXIMUM YARN STRENGTH.

To obtain maximum yarn strength, mills should analyze the results of a study by the Southern Regional Research Laboratory on the "Effects of Cotton Fiber Fineness on the Physical Properties of Single Yarns." Published in the October 1951 issue of Textile Research Journal, the study gives valuable data on the selection of warp twist multipliers, filling, and knitting-yarn twists with respect to the fineness or coarseness of the cotton used.

Practical mill applications of the study were reported by the authors, Louis A. Fiori and John J. Brown, as follows:

It is common mill practice to select warp twist multipliers on the basis of staple length alone. The twist multipliers selected are usually slightly higher than would be required for maximum yarn strength in order to allow for processing variables. Since fiber fineness, along with length, is an important factor in determining the twist multiplier needed to obtain maximum yarn strength, it follows that mills changing to finer cottons will benefit by using lower warp twist multipliers. A lower twist multiplier would result in higher single-yarn strength, with a corresponding increase in production. Since the present findings show that after maximum single-yarn strength has been reached, the addition of further twist exerts less influence on coarse than on fine cottons, it follows that small changes in twist can be made with coarse cottons without appreciably affecting yarn strength.

The tendency of the finer fibers to break with high turns per inch might explain, in part, the problem of kinky or unruly yarn. This study indicates that when relatively high twist multi-

pliers are used, a fine cotton will tend to become overtwisted and will kink or buckle, whereas a coarse cotton of equal staple length will have less tendency to do so. Possibly the presence in the raw-cotton mixture of immature cotton, which would react essentially like fine fibers, might cause seemingly inexplainable periods of kinky yarns, particularly if high twist multipliers are being used. A reduction in twist might help to solve such a problem. Furthermore, if mills change to cotton which is below average in maturity, they will find it advantageous to use fewer turns per inch in order to obtain maximum yarn strength.

These findings also demonstrate that the flexibility and loftiness required in knitting yarns can be obtained by using fine fibers in combination with low twist without appreciable losses in strength. Filling yarns are usually low-twist yarns and are spun into finer counts than warp yarns, primarily because they do not have to withstand weaving stresses and strains as much as warp yarns do. Filling yarns, therefore, are in that zone of twist range where coarse fibers react very quickly to changes in twist, making them susceptible to sizeable fluctuations in yarn strength. Further, fluctuations in the fineness of the raw-cotton mixture, with respect to fineness, would result in filling yarns of more uniform strength and fabric of better quality.

The study was summarized as follows: The effects of the single fiber property fiber fineness on the physical properties of single yarns, both coarse and fine and of varying twist, were investigated. To permit the study of fiber fineness while maintaining other important properties approximately constant, a special technique was used which controlled the length factor by reducing all the cottons to common quartile and mean lengths. The cottons selected—Seaberry Sea Island, Mesa Acala, Tanguis, and Rowden 41-B—represented extremes in fineness, ranging from 2.9 to 5.6 μg. per in., and had other important fiber properties approximately equal. The study showed mainly that a relationship exists between fiber fineness and the turns per inch required in a single yarn to obtain optimum yarn-strength benefits. Low-twist yarns decreased less rapidly in strength from maximum strength when made from fine than when made from coarse fibers. In contrast, high-twist yarns decreased more rapidly in strength when made from fine rather than when made from coarse fibers. Yarns made from coarse fibers required more twist to attain maximum yarn strength than those made from fine fibers. The study also revealed that fiber fineness does not materially affect yarn elongation. In addition, it was found that fiber fineness is a critical factor of roving twist. (*Textile Research Journal*, p. 750-757 (Oct. 1951).

DIFFERENTIAL DRAWING OF SLIVERS.

The idea of drafting a sliver according to its varying cross-sectional thickness has occurred to more than one mind: but it is not an idea easy to apply in practice. In normal drawing of both cotton and wool, attenuation proceeds gradually with drafting and doubling at each operation. In worsted drawing the drafting is done against twist in open and cone drawing and with twistless slivers in porcupine drawing. The same draft is applied to strong and weak places in the sliver, since these systems cannot discriminate between them.

Therefore the proposals outlined in British Patent 642,942 for differential drawing are interesting. In principle the sliver being drafted must first be rendered capable of conducting an electric current. This is done by immersion of the sliver in an electrolyte or a colloidal solution of graphite or metal. Other methods may also be suitable for making the sliver capable of conducting current. Conductivity depends on regain of the material and it is recommended that processing be done under controlled conditions of relative humidity.

The electrical resistance is higher with a small number of fibers and vice versa. It is on this principle that the idea depends. A varying number of fibers increases or decreases the electrical resistance and this controls the amount of draft applied to keep a constant number of fibers passing through the front roller. This is done by passing the sliver (between back and front rollers) through a pair of contact rollers. The upper roller is engaged by a contact arm held in position by a weight or spring to provide electrical contact. Connection is made to a motor controller which is responsive to changes in resistance brought about by varying numbers of fibers passing through the contact rollers, since the sliver has been rendered electrically conducting. A greater amount of current is supplied by the motor controller when the number of fibers in the sliver passing between the contact rollers increases; the speed of the motor driving the front rollers increases and more draft is applied. A combed sliver is necessary and of course the distance between front and back roller nips must exceed the length of the fibers.

It is claimed that repeated drawing operations are unnecessary as this method ensures efficient draft regulation. The idea certainly appears to have interesting possibilities in the drawing of cotton and wool slivers. (*Textile Industries and Fibres*, p. 189, June 1951.)

CONTINUOUS FLOW OF UNIFORM SIZE TO SLASHERS AVAILABLE WITH HYDROPULSE UNIT.

Continuous and uninterrupted preparation of warp sizing at a rate which approximates slasher box consumption is the principal advantage claimed for the Hydropulse, a device consisting of a heat exchanger and a high pressure homogenizer designed to work in tandem. Fresh size is continuously available as needed for application to the warp at the peak of its film-forming efficiency, according to the manufacturer.

Other advantages cited for the equipment are: No waste of sizing material; no varying dilution due to condensation of live steam, lower steam consumption; increased wearing efficiency; reduced shedding, hard size, and soft warps; no homogenizer downtime; unit is flexible and can be installed to meet requirements of any mill; low initial and operating costs; labor costs drastically reduced by continuous, almost automatic operation.

While the Hydropulse is designed to operate continuously it may be shut down by opening a single switch. The unit can be left standing without flushing or without loss of steam. Mfr: Scott & Williams, Inc., Pioneer Division, Empire State Building, New York 1, N. Y. (Sold and serviced in the South by Southern Sizing Co., East Point, Ga.) (*Textile Industries*, p. 151, November 1951).

SLUBS, GOUTS AND OTHER YARN IMPERFECTIONS.

That slubs and gouts, thick places, and bunches are expensive luxuries in any mill, can be exactly verified by watching with a critical attitude the breakages at the winder, at the loom or knitting machine, or the laborious and tedious work of the operative in the cloth room trying to convert seconds into firsts.

Slubs do not occur spontaneously; when you see one of these "pests," you can be sure that at some point in the manufacturing process, an operative was careless, or a supervisor negligent, or a machine operating in a dirty and inefficient manner. The root of slub prevention lies in vigilance, scrupulous cleanliness, and high operating standards.

To start a campaign to reduce the number of yarn imperfections due to the presence of foreign substances, and to harmful aggregates of fibers, it is necessary to start with the opening room. Here the routine must be established which will assure the complete absence from the mix of bunches of reworked stock improperly reduced to a suitable state for reworking. The reduction of the waste from the cards and drawing is a very difficult problem since these stocks, if fed in small and regular amounts, will be completely reduced by the time they have passed from the primary feeder through the opening line and pickers. But if the management is not careful about the control of the quality fed during a given time interval, the stock as it reaches the card room will be more or less "spotty," and these aggregates of reworked fibers will cause uneven drafting all through the mill.

Roving waste and spinning room scavenger waste, unless properly reduced, can cause lots of trouble. This reworked fiber always lacks the "spinnability" of a prime cotton with its natural spirality and the cohesion which it creates between the fibers in the strand. The difficulties created by the necessity of returning the clean, spinnable stock to the mix are far more serious than the average manufacturer seems to realize. That is why a waste control system which will keep top management always advised concerning the amount of reworkable waste made from day to day and its disposition, is a very valuable tool in the hands of those responsible for running the mill.

One of the preventable causes of damaged fibers which can create slubs and bad yarn is a daily inspection of the work turned out by the roving waste machine, especially when it is used to process the balls of spinning room scavenger waste. There is nearly always a piece of yarn in the center of one of the balls. Years ago, mills used a thread Extractor to take out these threads, but this practice seems to have died out. Therefore, unless the cylinder on the waste machine is properly adjusted, and the pins sharp and keen, the chances are that some of these thread fragments will pass into the mix, and eventually cause end breakages at some critical spot. Another fault common in reworking this waste is the use of improper equipment. For example, if the mill is running rovings up to two hank only, with low twist multipliers, the chances are that a satisfactory reduction can be accomplished with a single cylinder waste machine. On the other hand, if there are roving up to four hank and finer with a high twist multiple, then

a two cylinder machine may be needed. The point is that there is danger in over-working these stocks to a harmful extent.

Dirty screens, poor air currents, and failure to keep the sand boxes and waste compartments from becoming over full, allow small lumps of dirty fibers to find their way into the stock; sometime these aggregates or lumps fail to be taken out at the card, and then they will plug up the trumpet and cause a drawing frame stoppage.

Bad piecings are one of the most prolific causes of "slubs" and thick places. These bad piecings start right at the card, where the tender is not carefully trained. A heavy sliver will be formed every time that the card is "lapped." If the work at this point is not done with skill and care, the end will break down, making a choke at the coiler trumpet. Then comes more waste and another piecing.

Conventional four-roll drawing is often the cause of bad work unless the help is carefully trained and supervised. For in addition to the danger of slubs and thick places caused by bad piecings, there is the added danger of the creation of dirty slubs as a result of failure to keep the top and bottom clearers picked clean. In some mills, one can walk down a spinning room alley and see hundreds of these small dirty slubs of clearer waste which the stock has picked up from a dirty clearer.

It is a good rule to pick cleaners, both top and bottom, on drawing every doff of the cans. With good cotton, it may be all right to pick the bottom clearers every other doff, but the top clearers should be picked without question every time the set of cans is changed.

As an added precaution to the prevention of slubs while the work is passing through the roving frame. careful inspection of the clearers should be made at least once a week. This inspection should include the setting of the clearer frame, the condition of the cloth in regards to the nap and fit.

One of the greatest operational advantages of the modern two stage drawing system, using a lap winder as preparation for a drawing process, is the elimination of hundreds of thousands of piecings annually at the drawing frame, and the fact that if the operatives are careful and conscientious about their work, the piecings at the lap winder are almost undetectable in the sliver, as the fast operating and sensitive electrical stop motion will stop the end running out before it leaves the feed table, so that the operative can butt the end of the new card sliver accurately against the end of the sliver running out.

In the modern mill, where long drafts in the spinning room are now almost universally used, the roving naturally lasts much longer than was the case where the drafts were much shorter. Unless management is careful, the roving stored either on top of the frames or in bins and boxes, can become the source of slubs and thick places. The accumulation of dust, atmospheric fly, and lint from the frames can cause trouble unless the stock is cleaned before going into the creel. Where storage is necessary, the boxes and bins should have a fairly tight dust and lint-proof cover.

Dirty creel tops, roller beams, cap bars, weight hooks and saddles, both in carding and spinning, can cause harmful slubs. Other details on the roving frame which must be watched are the roving and sliver guides, which should be kept clean and of the proper size. If the roving guide is worn, the large opening will allow adhering accumulation of fly to pass through, and if there are rough places in the can, on the lifting roll, or other parts in contact with the sliver, the fly built up by contact with these rough places will pass along with the sliver and make a bad slub somewhere along the production line.

Today there are thousands of overhead cleaners in use in the spinning room; the function of these cleaners is the removal of fly and other undesirable accumulation from the creels, roller beams, and thread guide lappets. On the whole, these accessories do a very good job, but there are certain inevitable drawbacks in that fly removed by the air blast does not all go on the floor, by any means, but some stray amounts are caught by the yarn and twisted in as dirty slubs.

Further, unless the intensity and direction of the blasts of air are carefully adjusted, there will be damaged roving causing uneven yarn. The mills which have studied this problem have found that it is very helpful to run a little extra twist in the roving, in order to prevent the strand from becoming frayed by the air blast. The rate of travel, and the intervals between passes are also important in preventing the overhead cleaners from being troublesome as creators of yarn imperfections.

One of the most serious sources of bad slubs in the yarn comes from poor piecings by untrained and semi-skilled spinners. In these days of quality control, many yarn defects which would pass inspection in bygone years, are not allowable today.

In planning a systematic campaign to reduce these harmful yarn defects, the first step is a

survey and analysis of the yarn defects to determine their character, their frequency, and the cause of their origin. The best place to start this observation is at the winder or spooler, which the operatives can collect and hold the defects until they are given to the quality control department.

Here these slubs and gouts can be classified as to their constitution and type; for example, dirty brown slubs caused by inclusion of clearer waste; black ones caused by dirty hard piecings in the card room, long soft ones caused by the inclusion of flying waste in the spinning room; very thick places, caused by undrafted roving on account of bad top rolls.

The alert quality control department will soon work out a complete plan for finding out where the slubs come from, and then, with the cooperation of the operatives, can instill a campaign which will increase the efficiency of the winder, reduce loom stops and improve the quality of the cloth. (*Textile Age*, November 1951, pp. 10-14).

PRODUCE YOUR OWN HYPOCHLORITE FOR BLEACHING

A new electrolytic unit by which a plant may produce its own caustic soda and hypochlorite in small quantities as required, directly from common salt, has been developed by Amroc, Inc., 280 Broadway, New York 17, N. Y. The plant occupies a space of 3½ x 25 feet.

The unit is a caustic-chlorine-producing machine with auxiliary equipment to convert the chlorine into either sodium hypochlorite or a solution of calcium hypochlorite.

This unit, called the "Amroc Packet plant," consists of a highly developed mercury cell complete with denuder, a power rectifier, brine-preparation tanks (arranged vertically), brine-recirculation equipment, caustic-receiving tank, hypochlorite-absorption tower, etc., all mounted on a single foundation. No special housing is necessary. The plant is said generally to require no more space than that previously occupied for storing the chemicals. (*Textile World 101*, page 125, November 1951).

YARN BREAKAGE DETECTION BY ELECTRONIC RAY

For thread or yarn breakage detection in the textile and rope-making industry, Elcontrol Ltd., Industrial Electronic Engineers, of London, have developed the Elcontrol Industrial Electronic Relay which has been specially designed for use under arduous industrial and climatic conditions. The Relay is dust-proof, moisture-

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proof and can be mounted practically anywhere and is of particular value in textiles because of its sensitivity.

A contact displacement of the order of 1/100,000 of an inch or less will complete the pilot circuit and operate the relay. As a result it enhances the sensitivity of limit switches, thermostats, dimension gauges and similar devices based on limited contact movement and negligible contact pressure.

For textile use, the Relay is actuated by any standard drop wire or drop arm system—Elcontrol Ltd. are not yet manufacturing these systems—and although the drop wire contracts are frequently covered with fluff and dust, resulting in high contact resistance preventing direct operation of brakes or alarms, the Relay intersposed between the drop wire and the brake and signal circuits, work effectively under these conditions. *Textile Mercury 75,* 595 (October 1951).

MACHINE DYES OR SCOURS RAW STOCK CONTINUOUSLY

A new machine for the continuous dyeing or other processing of fibers, stock, or staple has been developed by General Dyestuff Corp., 435 Hudson St., New York 14, N. Y. Machines will be supplied by Morrison Machine Co., Paterson, N. J. The new equipment is said to be particularly adapted to the application of vat and naphthol colors to rayon staple.

Contact time of the entering material with the dye liquor, is reported to be very short. Whenever a process calls for fairly short exposure of materials to treating solutions, this new machine is considered suitable. Chemical treatment, dyeing, and scouring of wool as well as of all other fibers have been done satisfactorily. (*Textile World 101,* page 125, November 1951.)

UNIFORMITY ANALYZER FEATURES IMPROVEMENTS

A Uniformity Analyzer, originally conceived and designed by the Institute of Textile Technology, is now available for delivery. Designated Model BL-314A, the analyzer contains a slot in which a condenser is mounted. The material being tested (yarn, roving, or sliver) passes between the plates of the condenser, and its capacity varies directly with variations in the weight of the material. Through an electronic circuit, the differences in capacity are indicated as percentage deviation from normal on both a meter and on the permanent chart. In measuring yarn, the operator can show non-uniformity by one-half inch lengths, or by lengths of six inches, one foot, or one yard. Mfr: Brush Development Co., 3405 Perkins Ave., Cleveland 14, Ohio. (*Textile Industries,* P. 143, November 1951.)

RECTILINEAR WORSTED COMB

Manufactured by Officina Meccanica Sant' Andrea, Italy, a rectilinear worsted comb is equipped with a rotating coiler head at the delivery to provide for a greater consistency of the fibers as well as permitting an increase of 40 per cent of the stock delivered into the can. The machine is also equipped with electric stop motions on creel and delivery, automatic lubrication, and special pinning to adapt it to all types of fibers ranging from 2″ to 6″ staple length.

The comb is constructed in 19″ and 13″ widths, and in addition to combing and re-combing of wool is also used for combing cut staple carded synthetics or staples processed on the Pacific Converter. Agent: Ernest L. Frankl Assoc., 22 East 40th Street, New York 16, N. Y. (*Textile Industries,* P. 141, November 1951.)

A NEW CONTINENTAL WORSTED RING SPINNING FRAME

Among the new ideas seen at the recent Lille International Textile Exhibition was one featured in a new Continental type worsted ring spinning frame known as the "Super Rotaring" L.P. made by Comptoir des Broches S.A. This frame has been developed by a picked team of technicians and it is claimed that its use enables a better quality yarn to be produced at lower cost.

There are a number of novel features: One is the employment of rotary rings. It is a well known and acknowledged fact that one of the factors influencing the speed of the ring spinning spindle is the limiting traveller speed which increases with higher spindle speeds or larger diameter rings. In order to overcome this drawback, the actual rings are made to rotate. These rotary rings are mounted on ball bearings and mounted in a stationary ring rail.

The ring arrangement reduces friction and traveller speed can be doubled or even trebled without frictional difficulties. For example, if 20 meters per second is the maximum traveller speed possible under normal conditions, with rotary rings, up to 40 or 50 meters per second is possible. If necessary, the rings can be run at 10,000 revolutions per minute or the ring speed can be adjusted to suit requirements. The speed of the rings, therefore, can coincide with that of the spindles. In such a case, friction of the traveller upon the ring is virtually nil. To the practical man, the advantages of this are immediately obvious. Very low twists for relatively fine counts

can be used. This low twist content increases front roller delivery and hence frame output. (*Textile Industries and Fibres*, September, 1951, pp. 294-295).

ASSESSMENT OF A CARDED WEB

In practice the quality of a carded web, whether it be from a woolen, worsted, or felt card, is assessed by observation rather than by a laboratory test. When an overseer inspects a web he looks mainly for cloudiness, nep content, and the presence of vegetable and thready matter.

Cloudiness denotes entangled clumps of fibers and lack of mixing and since disentanglement is one of the chief functions of a card this defect is an indication that the fibers have not been thoroughly disentangled. The fault usually arises from either insufficient carding power; the machine may be too short or it may not be functioning properly, or from passing too thick a stream of material through the machine. It might also be caused by irregular feeding when the material is fed to the machine in varying thicknesses, but it will be seen that this is in effect the same as passing too thick a stream through the machine in a periodic manner. Cloudy slivers are more common when dyed wools are carded because these are more entangled than white fibers. If the cloudiness is not excessive and the count is coarse then the yarns might be just as regular as if the web had been perfect, but if fine yarns are being made then this fault cannot be tolerated.

The degree of neppiness in a sliver which can be tolerated again depends on the count of yarn being spun and also on the appearance of the finished fabric. Neps in the first place result from the entangled state of the finer virgin wools, and they are very common in the worsted trade. They are also present in slivers from the woolen and felt cards where the original blend often contains a fair proportion of noil; the latter of course is very neppy and it is often very difficult to open these tight clusters of fibers. The degree of tolerance is also modified by the trade. Worsted combers do not object to slivers containing some neps, providing they are large enough to be obstructed by the comb pins, but they do object to the very fine pin-head variety. And slivers which would be considered intolerable in the cloth

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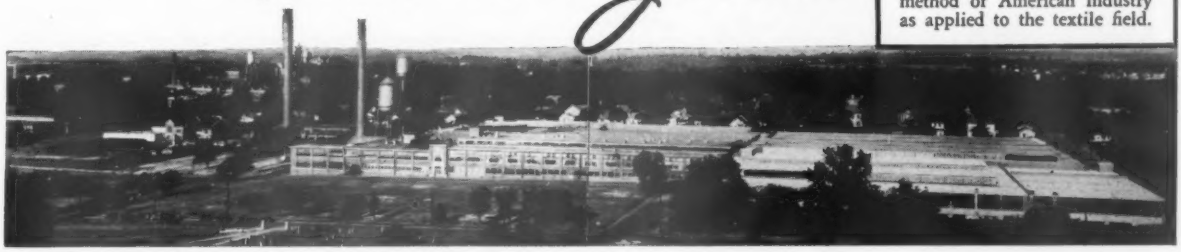

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making industries are accepted as normal in the felt and hat trades, simply because their presence is unnoticed in the finished product. One of the difficulties in assessing the neppiness of a sliver lies in defining a nep, it is only possible to judge these by their size and since it has been shown that large neps are not really troublesome in some cases while in fine yarn spinning the smallest neps are a nuisance, then it will be seen that it is difficult to arrive at a definition which would satisfy all branches of the industry. Nep counts are actually made in worsted carding but it is necessary to know the standard accepted before one can compare figures obtained from different webs.

The degree of vegetable matter found in a web is determined largely by the amount and type in the original wool. Carbonized wools are mainly used in the hatting and felt trades so this problem does not arise in these instances, but in the woolen industry the wool may or may not be carbonized, depending on the amount, the deburring equipment of the card and the requirements of the cloth. The worsted industry, on the other hand, seldom uses carbonized wools and relies on the card and comb for the effective removal of this defect.

Another problem in the true assessment of a web would be to obtain some measure of the degree of disentanglement brought about in the card. By the very nature of things a web must consist of fibers which hold each other together and so they must be entangled to some degree but when does this entanglement become detrimental to subsequent processing? Is it possible for a web to be so entangled that the fibers are prevented from drafting in spinning or gilling prior to combing? It is easy to see that the one extreme condition of entanglement would be complete disentanglement, that is when the fibers in the web are parallel one with the other, but it is difficult to define the other extreme of maximum entanglement and if one takes a web and tries to assess this property it will be found to be almost indefinable. It is, of course, realized that this statement is no solution to the problem, but it is doubtful whether we shall ever break away from the vague generalities of carding until we can assess more accurately the properties of the web. One method, at any rate, of comparing the products of cards is to preserve samples of webs between adhesive transparent cellophane sheets. This material can be bought in four inch widths and after mounting the web can be filed away for future reference. (*Wool Review*, October 1951, p. 37.)

IMPROVED BRUSHING MACHINE HAS SPLIT-SECOND BRAKE

A new element in the design of the latest brushing machine made by Hermas Machine Co., Warburton Ave., Hawthorne, N. J., is a Warner electricbrake system designed to assure instant and simultaneous stopping of all the brush rolls together, as well as simultaneous stopping of the Hermas shear.

The braking system is applied to the separate brush rolls, each of which has its own motor. Control of the entire system is by the stop button on the shear. There'll be no more piled-up goods between brush and shear, according to the maker. (*Textile World 101*, page 127, November 1951.)

THE BARELLA REGULARIMETER

The latest apparatus developed in Spain for the analysis and control of yarns is the "Barella regularimeter," invented by Don Alberto Barella.

Apparatus hitherto used for determining the regularity of yarns were limited to giving results based on appraisal of a purely subjective and comparative nature, allowing no possibility of arriving at more concrete and absolute data. The electronic regularimeters, on the other hand, were beyond the reach of many Spanish industrialists on account of their high price and the difficulties of importing them. The appearance of the Barella apparatus has made available a simple regularimeter combining a number of advantages which render it useful for serial tests and investigational studies, advantages not generally found in other existing types of regularimeter.

The basic principle on which this apparatus is designed is the projection, suitably enlarged, of the yarn on a screen. In this way the diameter of the yarn can easily be measured, and, consequently, its regularity can readily be calculated by a statistical study of the various values obtained for the diameter at different points along the length of the yarn.

Diameter and regularity of yarns vary considerably with alterations in their tension or twist. Bearing this in mind the Barella regularimeter provides for the measuring of such parameters and for the possibility of varying them according to the special object of the investigation made.

There is a projector of cinematographic type, in front of which is passed the yarn the regularity of which is to be measured. This yarn is wound on a bobbin set in a special braking device, by means of which the tension at unwinding can be graduated at will. After leaving the brake the yarn passes through various thread-guides which lead it to a tensionmeter which checks the tension

at measurement. The yarn then passes in front of the optical projection system and is finally wound off on a small reel by means of a special hand-operated winding device.

The apparatus is also provided with a mechanism which makes it possible to study the effect of twist on the diameter and regularity of yarns. This device consists of two grips, the upper one being fixed, while the lower one revolves. There is a distance of 50 cm. between the two. The revolving grip can be wet in motion at will, and is provided with a corresponding computator. The image of the yarn is projected upon a screen at any enlargement desired. The figure for the diameter can be read off the screen by means of a simple graduated rule. A recording apparatus is at present being designed which will take photodiagrams of the yarn.

The verifications and tests which can be carried out with the Barella regularimeter are of many kinds. For instance:

1. Occular examination of the yarn by causing it to pass in front of the projector and observing its magnified image on the screen. In this way an idea can be formed of its appearance and regularity, the presence and nature of any faults, the fiber and fibers of which the yarn is made up, detection of possible admixtures, etc.

2. Determination of the diameter of the yarn by simply measuring it off the screen, the degree of magnification of the picture being known. By repeating this measurement several times at regularly, distributed points along the length of the yarn, the average diameter of the yarn can be found, and, from this, its number. Mfr.: J. Manish, Madrid. (*Textile Industries and Fibres*, pp. 193-4, June 1951.)

SHUTTLE REFINISHING AND SIZING MACHINE

For properly maintaining shuttles a Shuttle Refinishing and Sizing Machine is available. The machine will refinish each of the shuttle surfaces (front, back, and bottom) to accurate dimensions. The manufacturer states that in actual practice accuracy of plus or minus .003" has been obtained.

At the back of the machine a cutting wheel is provided for recutting the thread groove and for relieving the bottom of the shuttle.

Material for coating the refinished shuttle so that it can be immediately placed in operation in the loom is also available from the manufacturer of this machine. It is designated "Shuttle Refinishing Compound." Mfr.: Machine Design Products, Inc., 63 North Street, Grafton, Mass. (*Textile Industries*, p. 163, November 1951.)

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